DIRECT DRIVE STEREO TURNTABLE

PL-510A

<ART-182-0>

Service Manual

PIONEER®

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1. SPECIFICATIONS

MOTOR AND TURNTABLE

Motor:	DC servo motor
Turntable drive:	Direct drive
Speed:	Two speeds: 33-1/3 rpm, 45 rpm
Wow and flutter:	0.03% (WRMS) or less
S/N:	68 dB (DIN-B) or more (with Pioneer cartridge model PC-135)
Turntable platter:	321mm diam. aluminum alloy
Moment of inertia:	240 kg-cm^2 (including rubber mat)

TONEARM

Tonearm type:	Static-balance, S-shaped, pipe arm
Effective arm length:	221mm
Tracking error:	+3° ~ −1°
Overhang:	15.5mm
Usable cartridge weight:	4g (min.) ~ 10g (max.)

(For cartridge weighs over 8.5g, attach the sub weight)

SUBFUNCTIONS

Anti-skating force control
Plug-in type headshell
Oil-damped arm elevator
Hinges (Free-adjustable)
Lateral balance weight
Fine speed adjusters (33-1/3 rpm, 45 rpm: using the stroboscope for turntable speed adjustment).

ACCESSORIES

Headshell	1
Overhang gauge	1
EP adaptor	1
Screwdriver	1
Sub weight	1
Cartridge mounting screws	6
Cartridge mounting nuts	2
Cartridge mounting washers	2
Operating instructions	1

MISCELLANEOUS

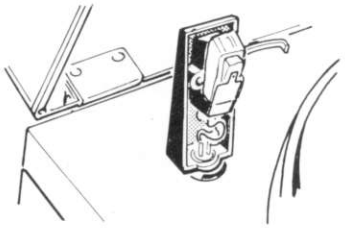
Power requirements:	AC 120V, 60Hz
Power consumption:	5W
Dimensions:	440(W) x 362(D) x 159(H) mm 17-5/16(W) x 14-1/4(D) x 6-1/4(H) in.
Weight:	8kg, 17lb 10oz

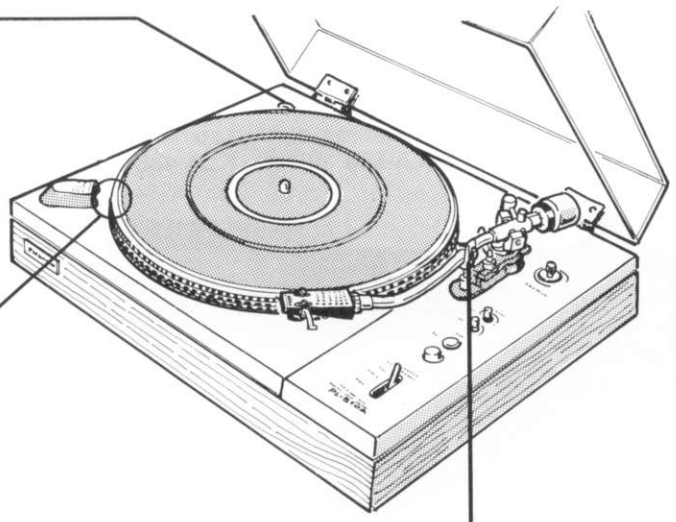
NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

2. PANEL FACILITIES

Headshell Stand

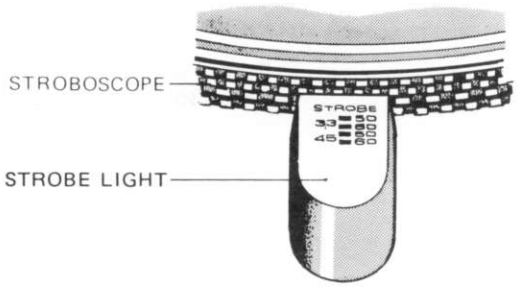
A spare headshell can be stored in this stand. Align the headshell pins with the stand grooves and insert.
Observe that the headshell length is not greater than the height of the dust cover. This stand can also be used for storing the EP adaptor.

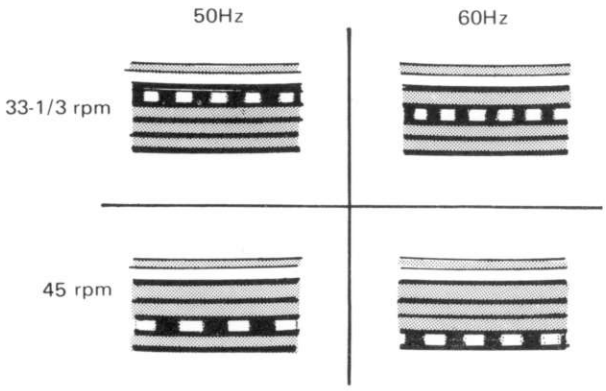




Stroboscope

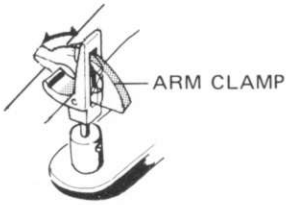
Fine adjustments of rotation speed can be performed with the aid of the stroboscope. Adjust the SPEED ADJ. knobs while observing the pattern indicated bellow. If the rotation is fast, the pattern will appear to move toward the left, while movement toward the right indicates slow speed. Correct speed is obtained when the pattern appears to be stationary.





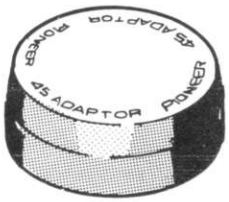
Arm Rest

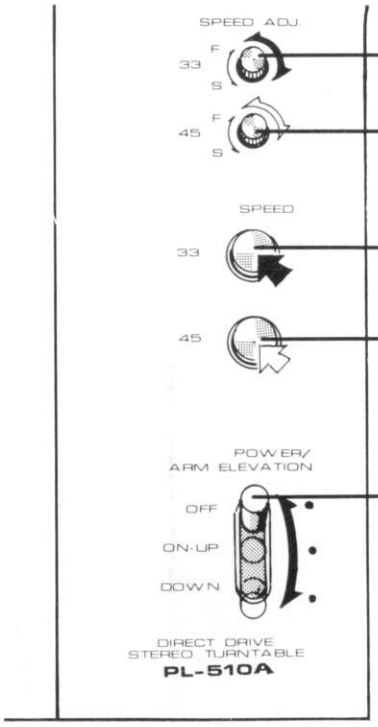
Supports the tonearm when not playing a record. At the end of a playing session, engage the clamp as illustrated below.



EP Adaptor

Place on center shaft when playing 45 rpm EP records.





33 SPEED ADJ. Knob
Use for fine adjustment of 33-1/3 rpm.

45 SPEED ADJ. Knob
Use for fine adjustment of 45 rpm.

33 SPEED Button
Depress to play 33-1/3 rpm records.

45 SPEED Button
Depress to play 45 rpm records.

Function Lever
This lever incorporates power switch and arm elevation functions.

- OFF — AC power is cut off.
- ON-UP — Power is turned ON. When set from DOWN to this position, the tonearm is raised.
- DOWN — Tonearm is gently lowered.

OPERATION

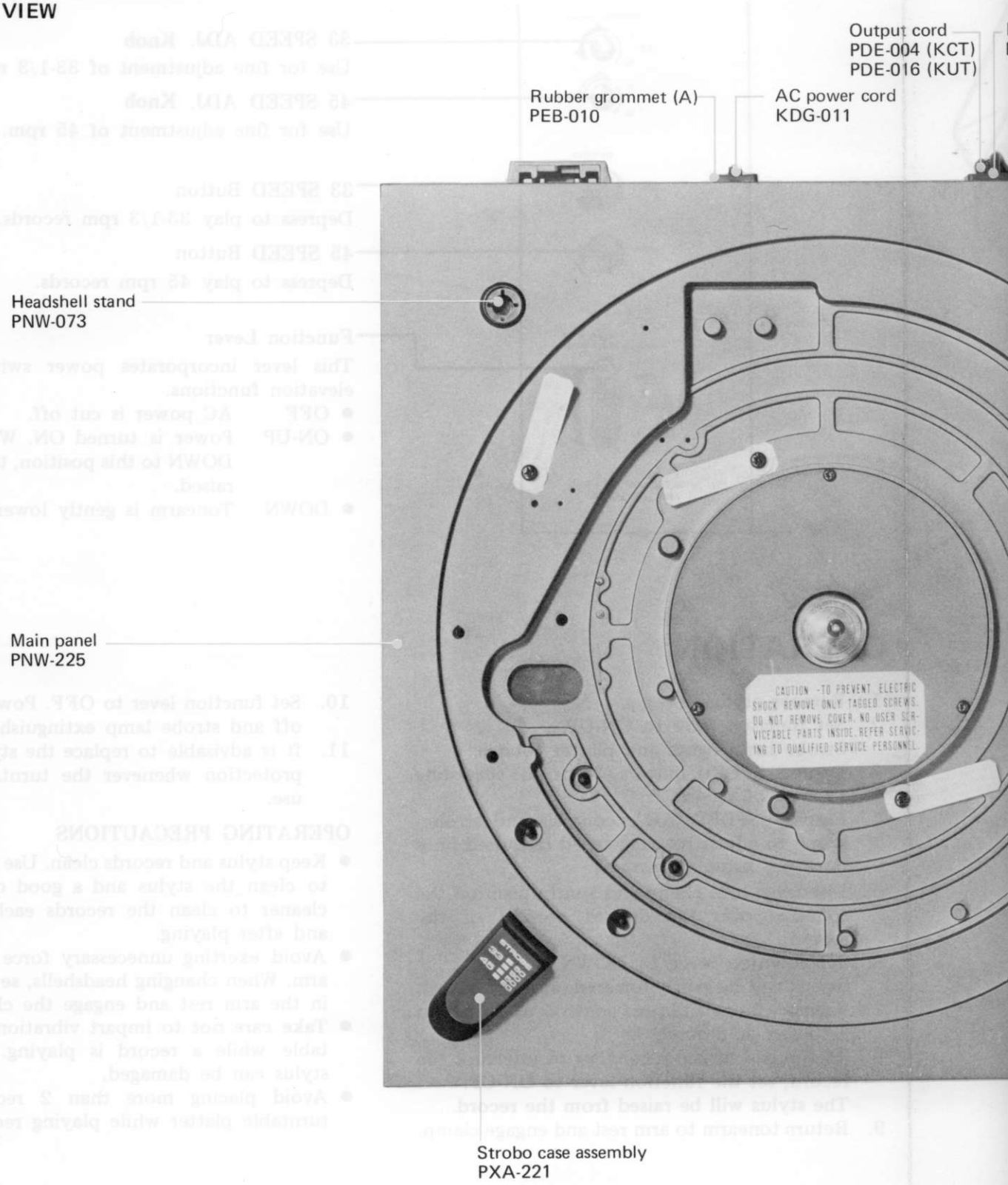
1. Remove stylus cover.
2. Set function lever to ON-UP.
   Strobe lamp lights and platter rotates.
3. Depress SPEED button (33 or 45) according to type of record.
4. Employ SPEED ADJ. controls and stroboscope to adjust rotating speed (required only once per listening session).
5. Disengage arm clamp and gently position the tonearm over the desired portion of the record.
6. Set function lever to DOWN.
   Stylus will be gently lowered onto the record.
7. Adjust volume and tone controls of the stereo amplifier as desired.
8. At the end of the record, or to interrupt the record, set the function lever to ON-UP.
   The stylus will be raised from the record.
9. Return tonearm to arm rest and engage clamp.
10. Set function lever to OFF. Power will be cut off and strobe lamp extinguished.
11. It is advisable to replace the stylus cover for protection whenever the turntable is not in use.

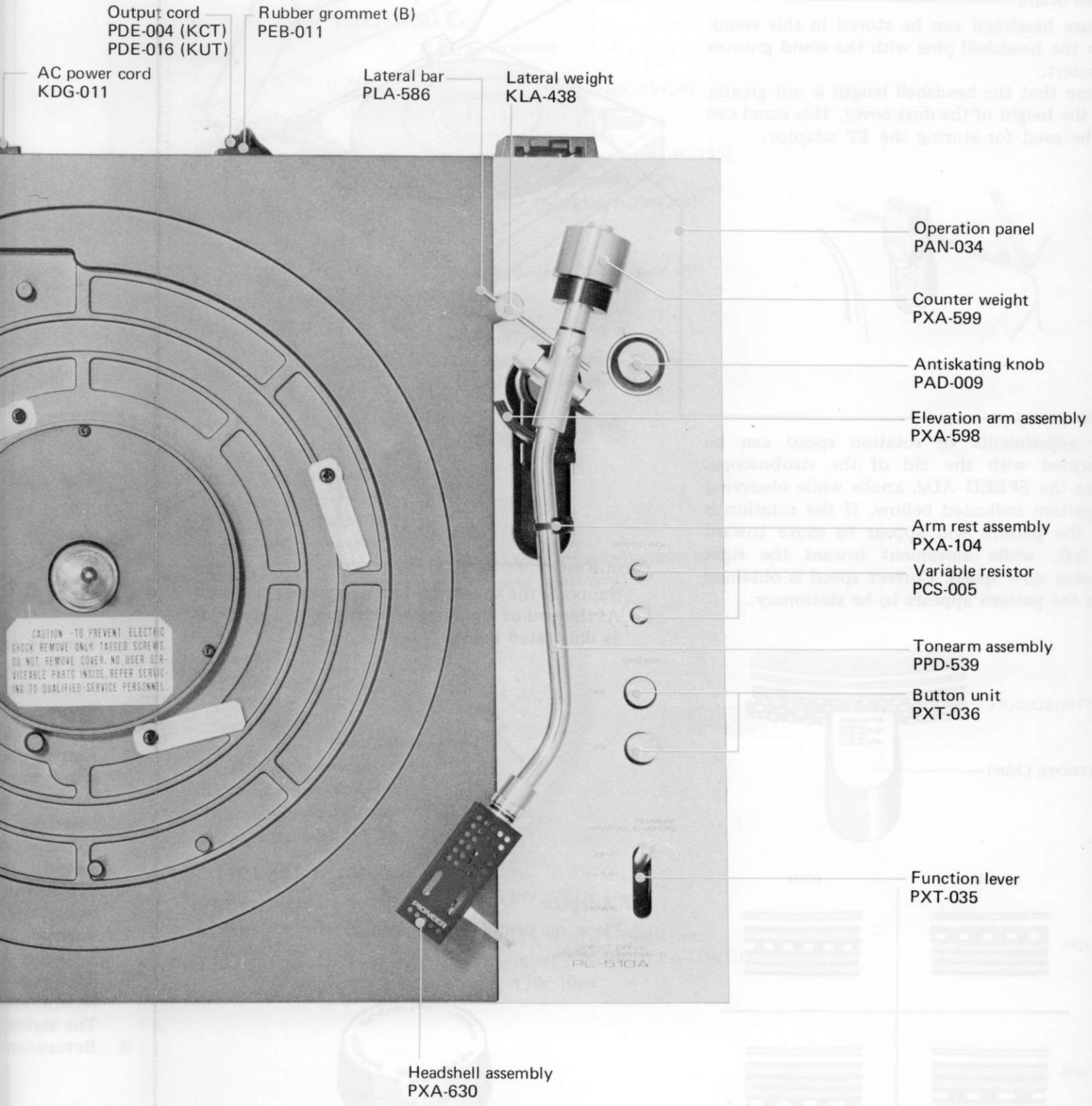
OPERATING PRECAUTIONS

- Keep stylus and records clean. Use a stylus brush to clean the stylus and a good quality record cleaner to clean the records each time before and after playing.
- Avoid exerting unnecessary force on the tonearm. When changing headshells, set the tonearm in the arm rest and engage the clamp.
- Take care not to impart vibration to the turntable while a record is playing. Record and stylus can be damaged.
- Avoid placing more than 2 records on the turntable platter while playing records.

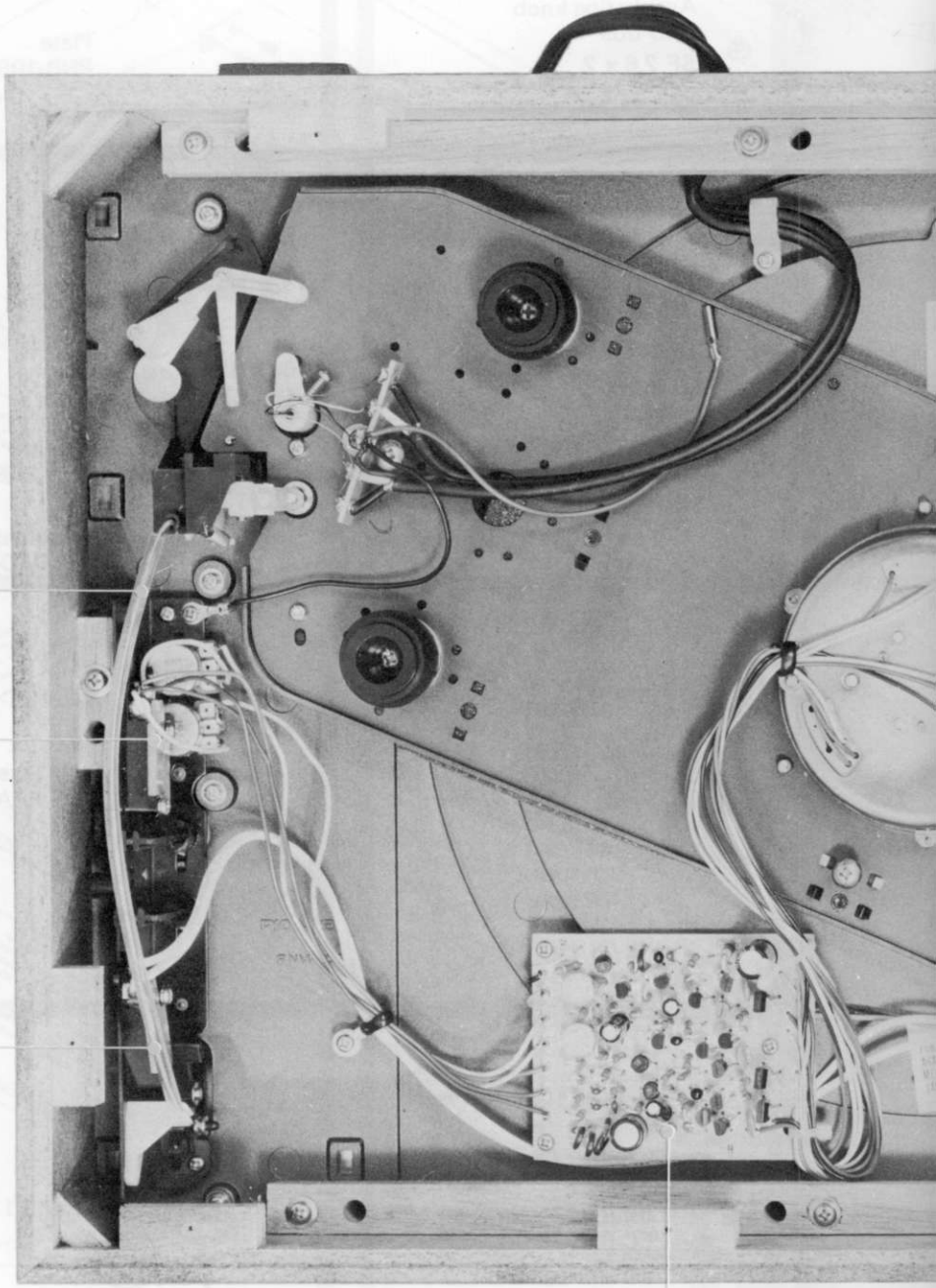
3. PARTS LOCATIONS

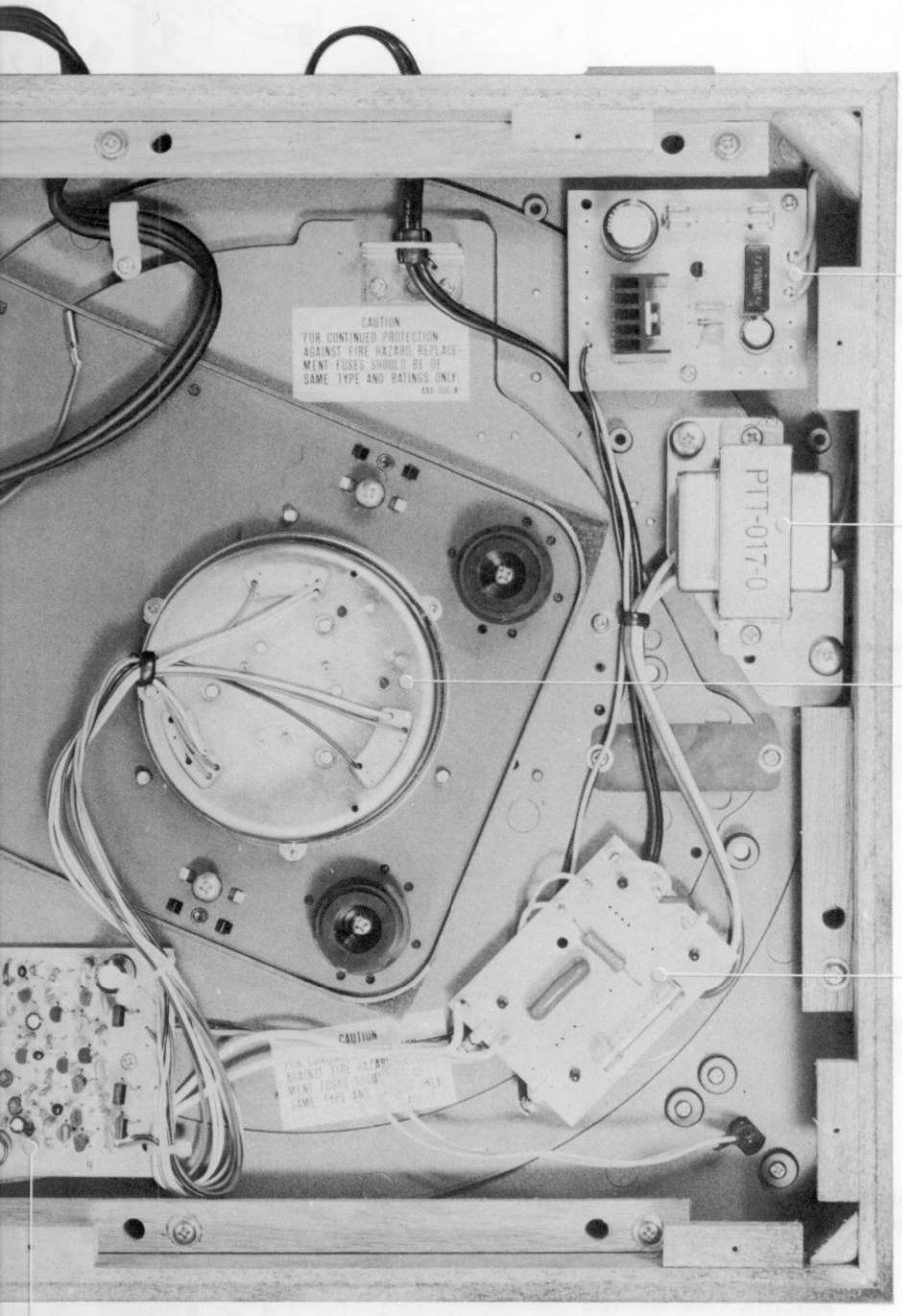
3.1 TOP VIEW




Output cord
PDE-004 (KCT)
PDE-016 (KUT)
Rubber grommet (B)
PEB-011
AC power cord
KDG-011
Lateral bar
PLA-586
Lateral weight
KLA-438
Operation panel
PAN-034
Counter weight
PXA-599
Antiskating knob
PAD-009
Elevation arm assembly
PXA-598
Arm rest assembly
PXA-104
Variable resistor
PCS-005
Tonearm assembly
PPD-539
Button unit
PXT-036
Function lever
PXT-035
Headshell assembly
PXA-630
CAUTION -TO PREVENT ELECTRIC SHOCK REMOVE ONLY TAGGED SCREWS. DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.
PIONEER
PL-510A

3.2 UNDER VIEW





Power supply assembly B
PWR-006

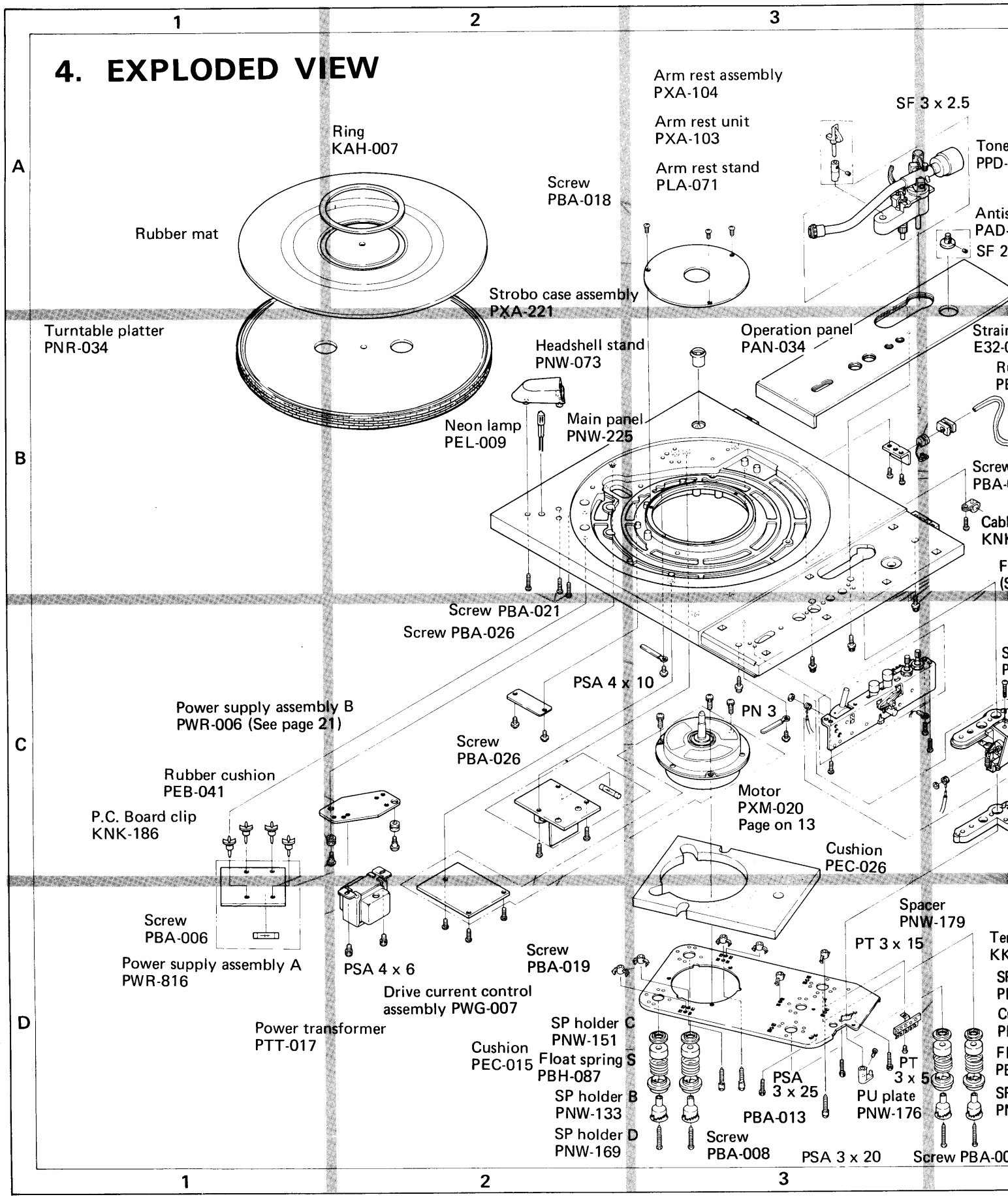
Power transformer
PTT-017

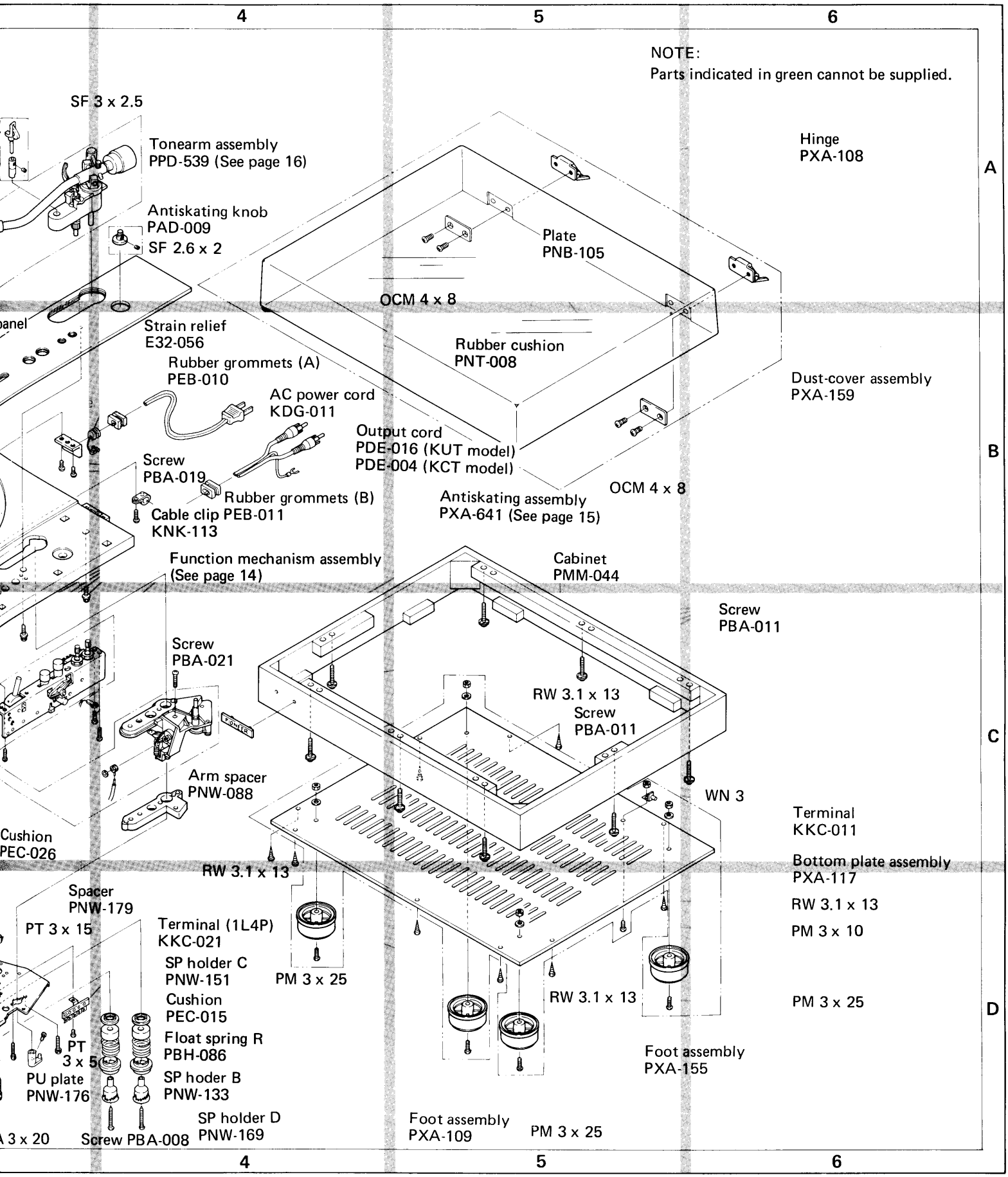
Motor (including
drive current
control assembly)
PXM-020

Power supply assembly A
PWR-816

Driving current control assembly
PWG-007

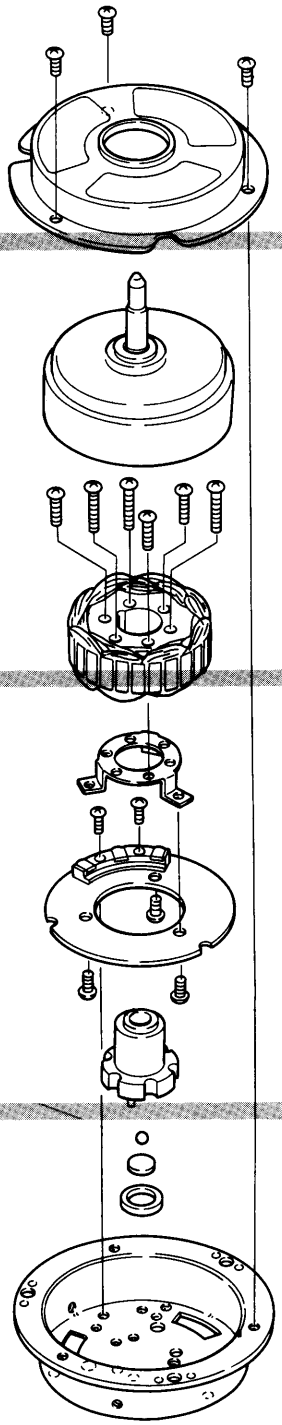
4. EXPLODED VIEW




4
5
6
NOTE:
Parts indicated in green cannot be supplied.
SF 3 x 2.5
Tonearm assembly
PPD-539 (See page 16)
Antiskating knob
PAD-009
SF 2.6 x 2
Hinge
PXA-108
A
Plate
PNB-105
OCM 4 x 8
Strain relief
E32-056
Rubber cushion
PNT-008
Rubber grommets (A)
PEB-010
Dust-cover assembly
PXA-159
AC power cord
KDG-011
Output cord
PDE-016 (KUT model)
PDE-004 (KCT model)
B
Screw
PBA-019
Rubber grommets (B)
OCM 4 x 8
Antiskating assembly
PXA-641 (See page 15)
Cable clip PEB-011
KNK-113
Function mechanism assembly
(See page 14)
Cabinet
PMM-044
Screw
PBA-011
Screw
PBA-021
RW 3.1 x 13
Screw
PBA-011
C
Arm spacer
PNW-088
WN 3
Terminal
KKC-011
Cushion
PEC-026
Bottom plate assembly
PXA-117
RW 3.1 x 13
Spacer
PNW-179
PT 3 x 15
Terminal (1L4P)
KKC-021
PM 3 x 10
SP holder C
PNW-151
PM 3 x 25
Cushion
PEC-015
RW 3.1 x 13
PM 3 x 25
D
PT
3 x 5
Float spring R
PBH-086
Foot assembly
PXA-155
PU plate
PNW-176
SP hoder B
PNW-133
SP holder D
PNW-169
Foot assembly
PXA-109
PM 3 x 25
Screw PBA-008
4
5
6

4.1 MOTOR (PXM-020)

NOTE:
Parts indicated in green cannot be supplied.



PT 2.6 x 6

PM 2.6 x 20

PM 2.6 x 30

Locational detector assembly
PWX-004

PM 2.6 x 6

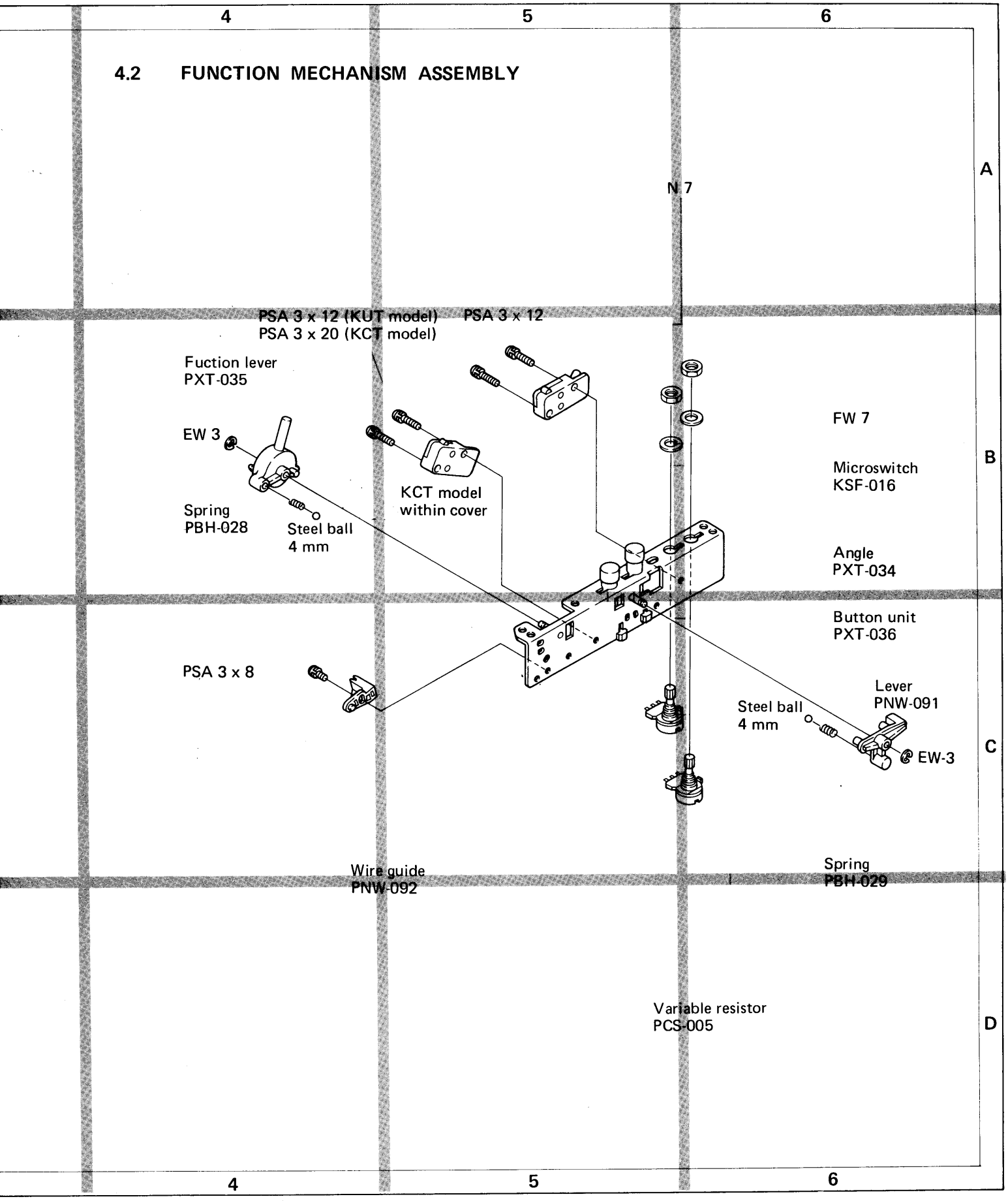
PM 2.6 x 3

Steel ball (B)
PEF-001

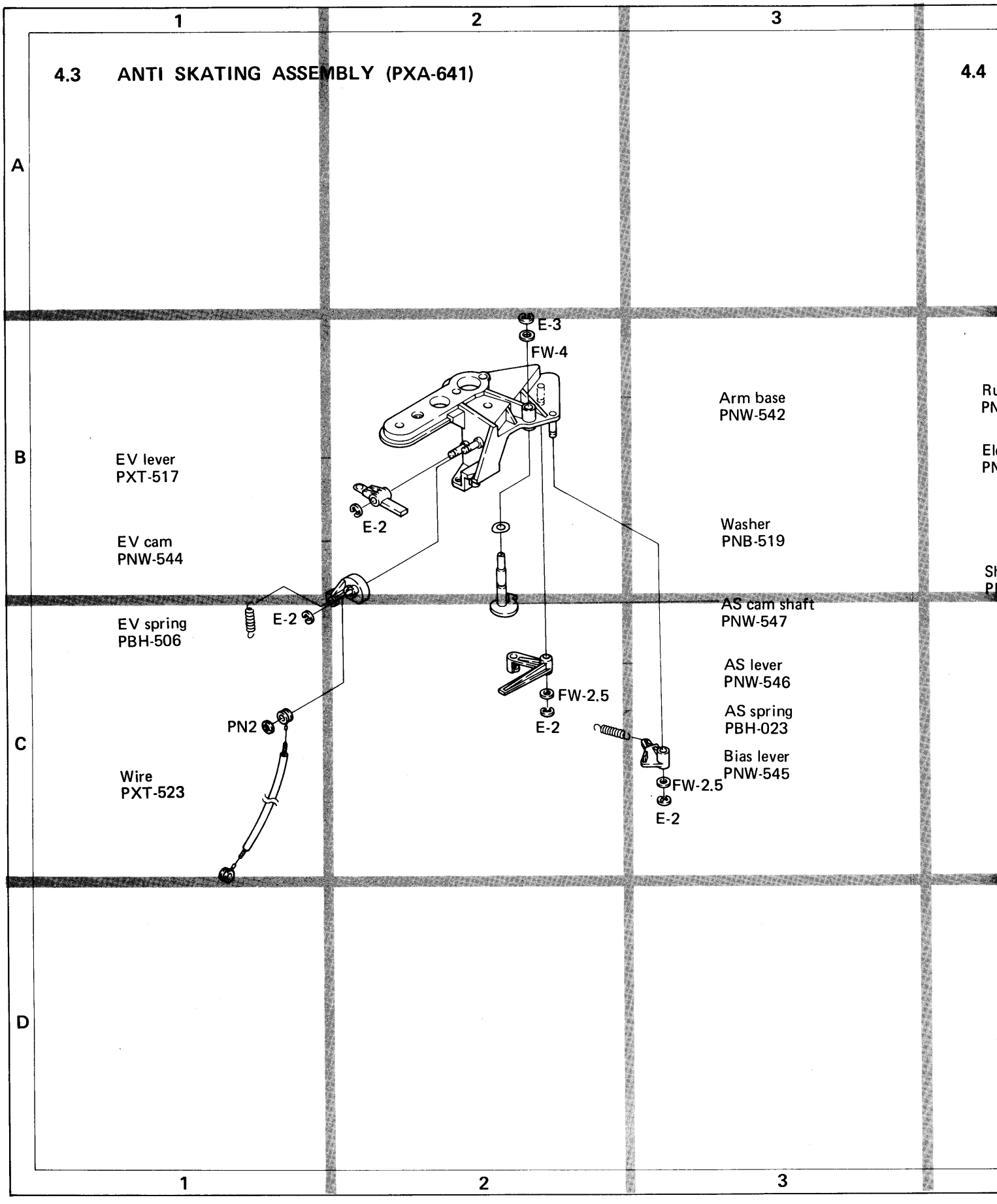
Thrust catch
PNW-011

Rubber bush
PNT-002

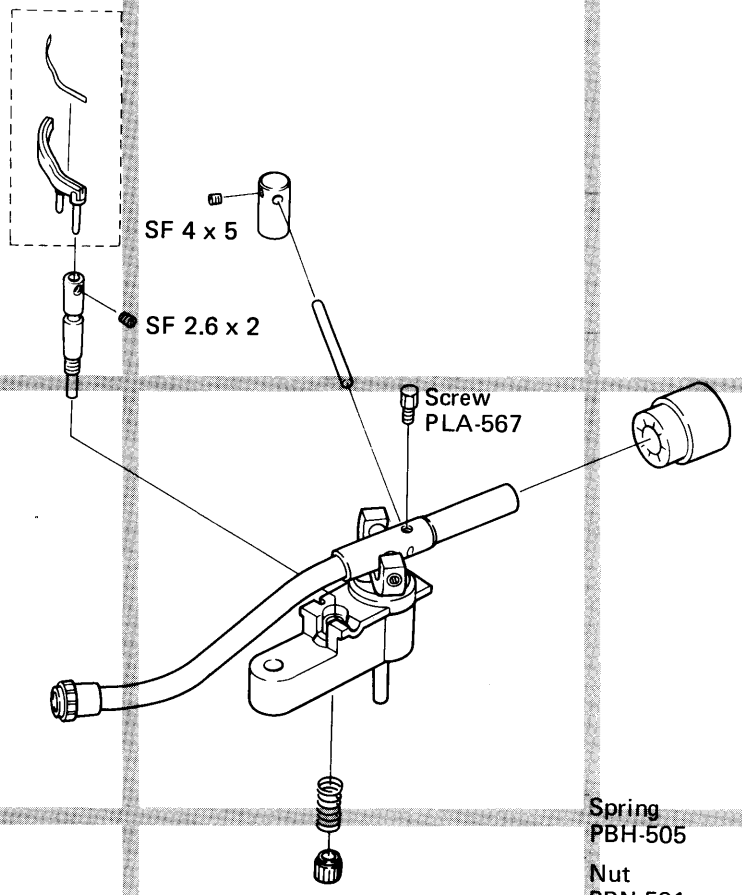
4.2 FUNCTION MECHANISM ASSEMBLY



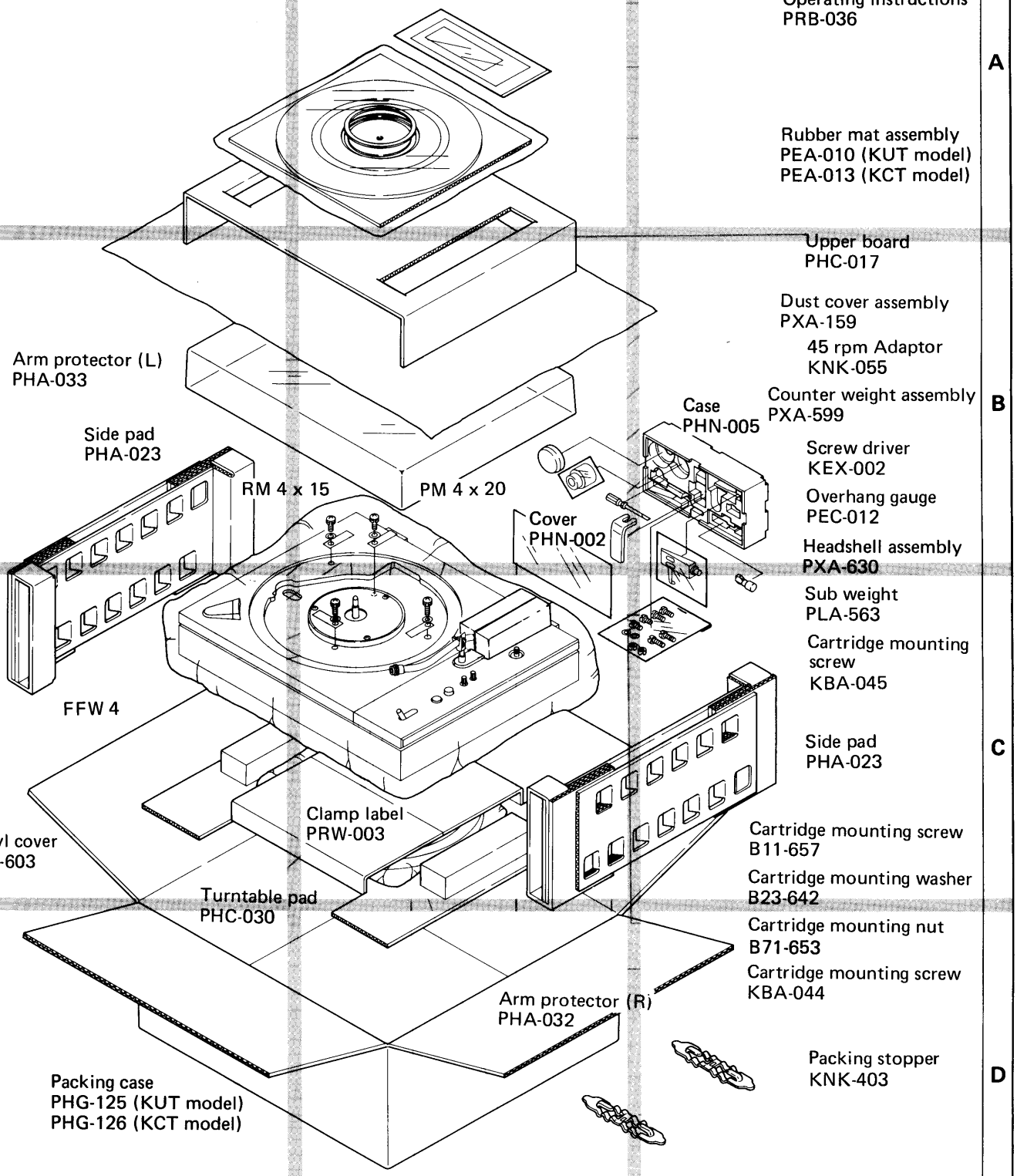
4.3 ANTI SKATING ASSEMBLY (PXA-641)



4.4 TONEARM ASSEMBLY (PPD-539)



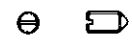
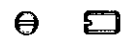
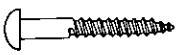
4.5 PACKING


Operating instructions
PRB-036
Rubber mat assembly
PEA-010 (KUT model)
PEA-013 (KCT model)
Upper board
PHC-017
Dust cover assembly
PXA-159
45 rpm Adaptor
KNK-055
Counter weight assembly
PXA-599
Screw driver
KEX-002
Overhang gauge
PEC-012
Headshell assembly
PXA-630
Sub weight
PLA-563
Cartridge mounting screw
KBA-045
Side pad
PHA-023
Cartridge mounting screw
B11-657
Cartridge mounting washer
B23-642
Cartridge mounting nut
B71-653
Cartridge mounting screw
KBA-044
Packing stopper
KNK-403
Arm protector (L)
PHA-033
Side pad
PHA-023
RM 4 x 15
PM 4 x 20
Case
PHN-005
Cover
PHN-002
FFW 4
Clamp label
PRW-003
Vinyl cover
H56-603
Turntable pad
PHC-030
Arm protector (R)
PHA-032
Packing case
PHG-125 (KUT model)
PHG-126 (KCT model)
Turntable platter
PNR-034

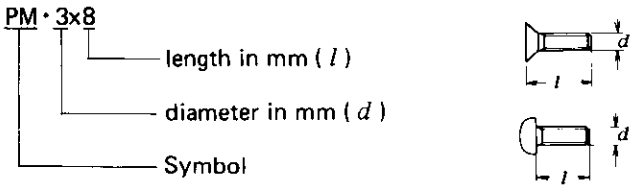
5. NOMENCLATURE OF SCREWS, WASHERS AND NUTS

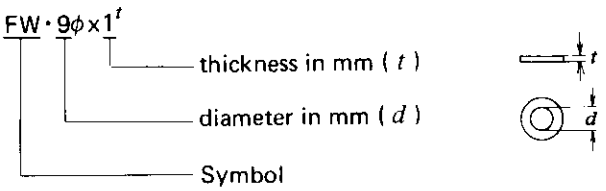
The following symbols stand for screws, washers and nuts as shown in exploded view.

Symbol	Description	Shape
RT	Brazier head tapping screw	
PT	Pan head tapping screw	
PTT	Special screw (A)	
PTBA	Special screw (B)	
POTBA	Special screw (C)	
OCT	Oval countersunk head tapping screw	
PM	Pan head machine screw	
CM	Countersunk head machine screw	
OCM	Oval countersunk head machine screw	
TM	Truss head machine screw	
BM	Binding head machine screw	
PSA	Pan head screw with spring lock washer	
PSB	Pan head screw with spring lock washer and flat washer	
PSF	Pan head screw with flat washer	

Symbol	Description	Shape
EW	E type washer	
FW	Flat washer	
SW	Spring lock washer	
N	Nut	
WN	Washer faced nut	
PN	Push nut	
FFW	Fiber flat washer	
SC	Slotted set screw (Cone point)	
SF	Slotted set screw (Flat point)	
HS	Hexagon socket headless set screw	
OCW	Oval countersunk head wood screw	
CW	Countersunk head wood screw	
RW	Round head wood screw	

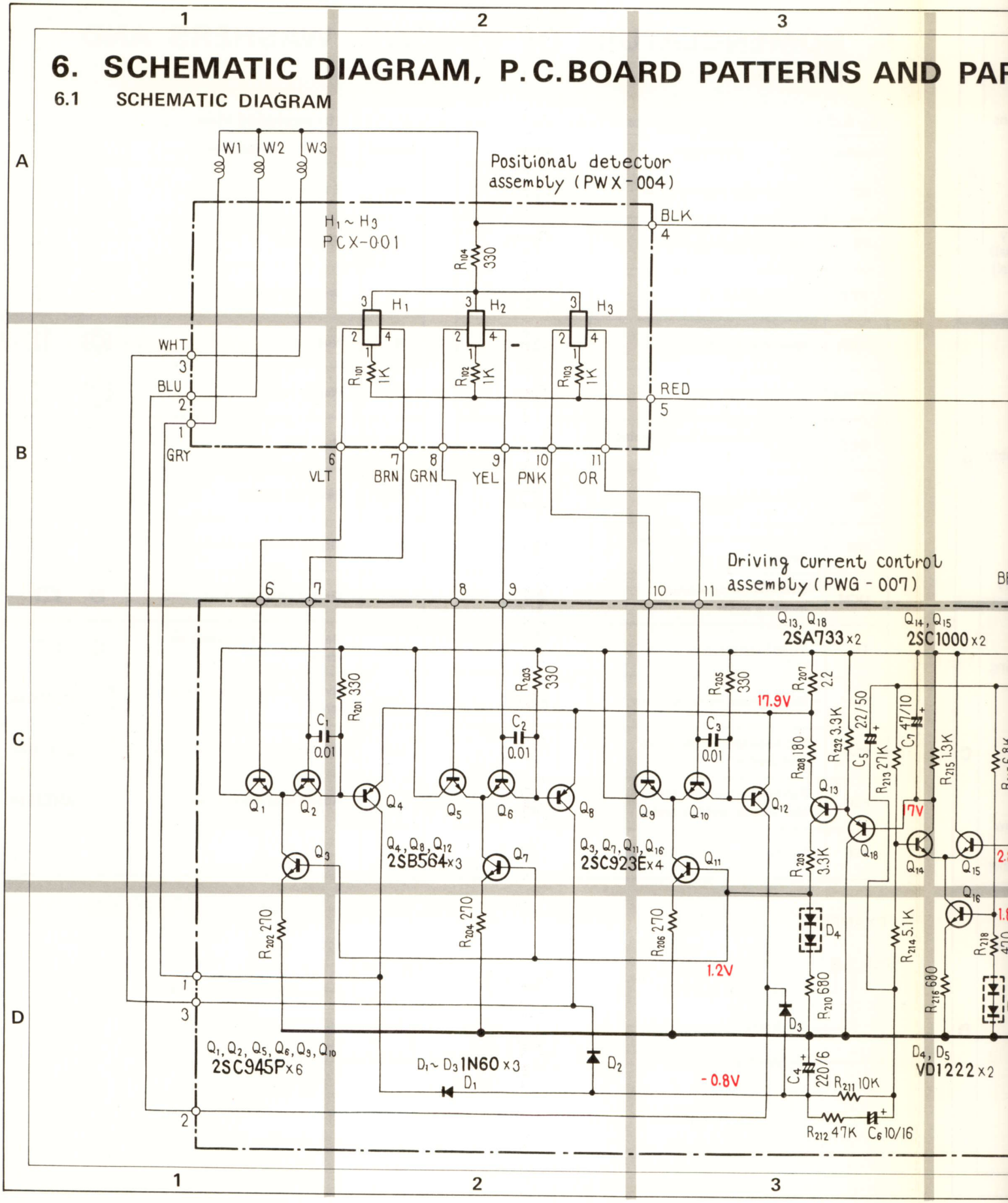
EXAMPLE



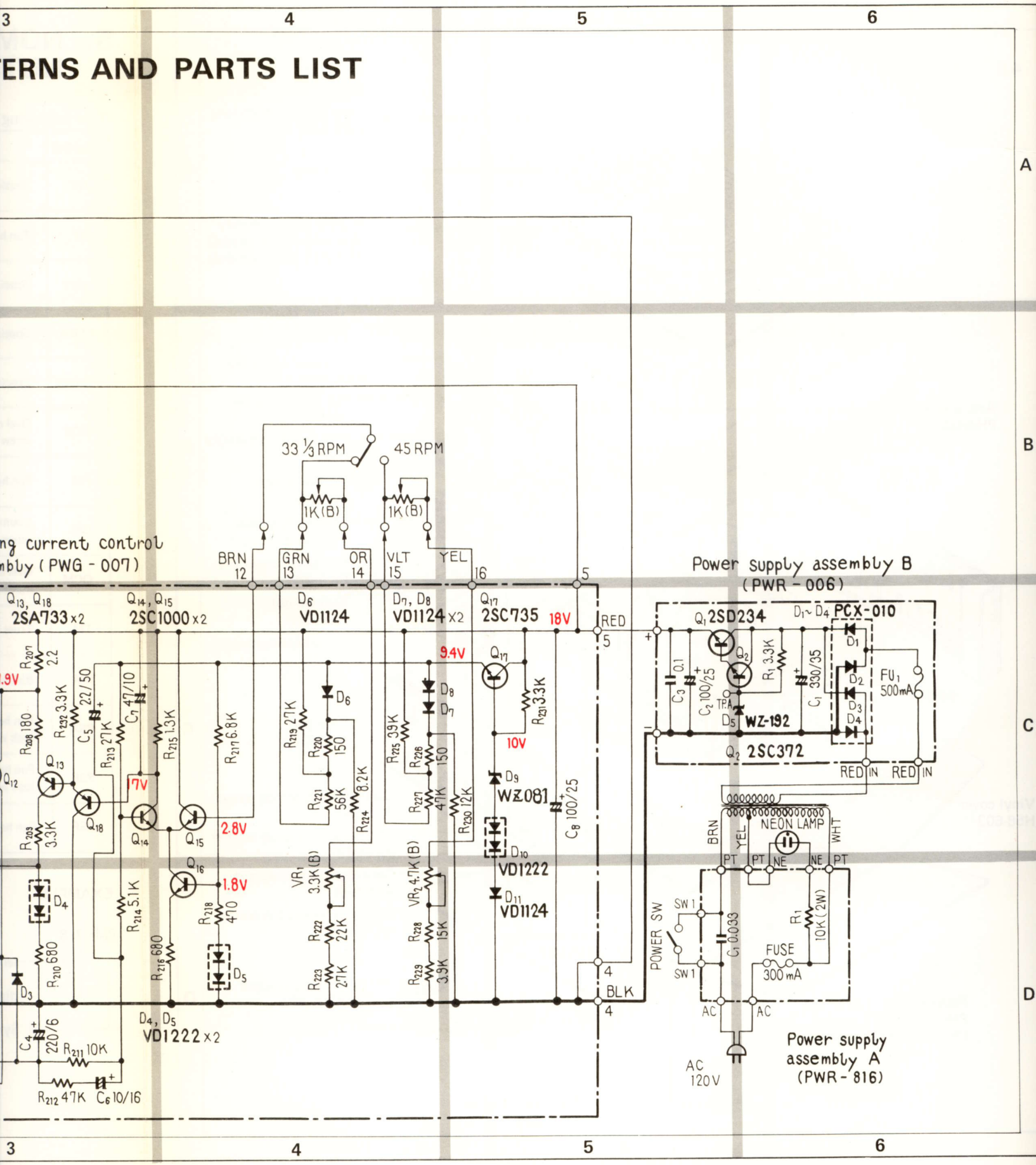


6. SCHEMATIC DIAGRAM, P.C.BOARD PATTERNS AND PAR

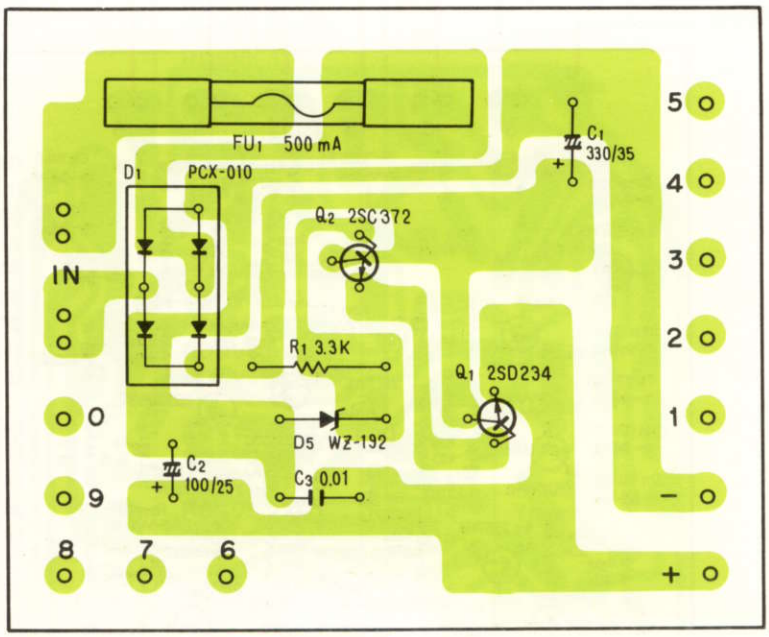
6.1 SCHEMATIC DIAGRAM



TERNS AND PARTS LIST



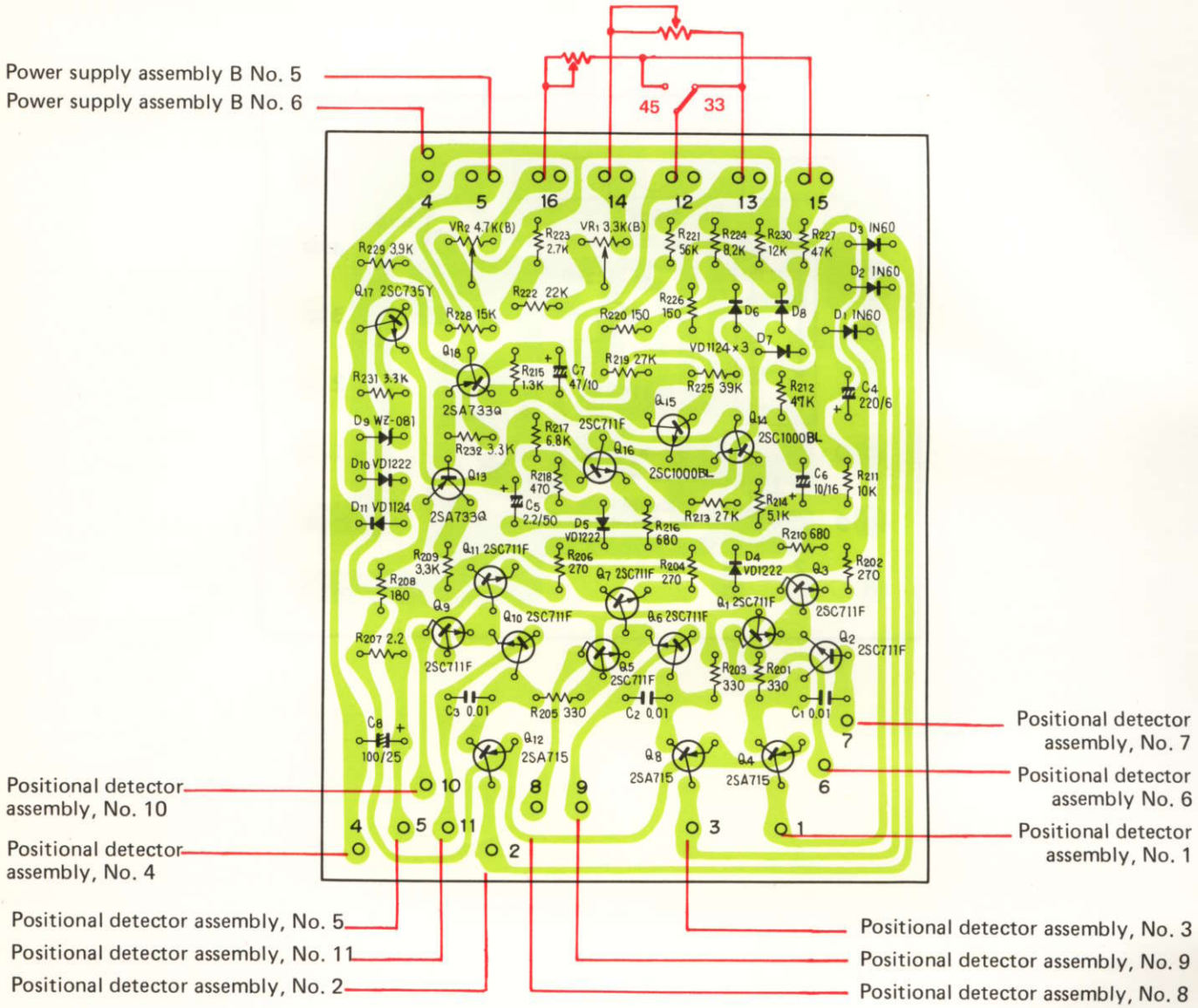
6.2 POWER SUPPLY ASSEMBLY B (PWR-006)



Parts List of Power Supply Assembly B (PWR-006)

Symbol	Description			Part No.
C1	Electrolytic	330	35V	CEA 331P 35
C2	Electrolytic	100	25V	CEA 101P 25
C3	Ceramic	0.01	50V	CKDYF 103Z 50
R1	Carbon film	3.3k		RD¼PS 332J
Q1	Transistor			2SD234
Q2	Transistor			2SC372
D1	Diode			PCX-010
D2	Zener diode			WZ-192
FU	Fuse	500mA		PEK-004
	Fuse clip			K91-006

6.3 DRIVING CURRENT CONTROL ASSEMBLY (PWG-007)



Parts List of Driving Current Control Assembly (PWG-007)

CAPACITORS

Symbol	Description			Part No.
C1	Ceramic	0.01	50V	CKDYF 103Z 50
C2	Ceramic	0.01	50V	CKDYF 103Z 50
C3	Ceramic	0.01	50V	CKDYF 103Z 50
C4	Electrolytic	220	6V	CEA 221P 6
C5	Electrolytic	2.2	50V	CEA 2R2P 50
C6	Electrolytic	10	16V	CEA 100P 16
C7	Electrolytic	47	10V	CEA 470P 10
C8	Electrolytic	100	25V	CEA 101P 25

RESISTORS

Symbol	Description		Part No.
R201	Carbon film	330	RD¼VS 331J
R202	Carbon film	270	RD¼VS 271J
R203	Carbon film	330	RD¼VS 331J
R204	Carbon film	270	RD¼VS 271J
R205	Carbon film	330	RD¼VS 331J
R206	Carbon film	270	RD¼VS 271J
R207	Carbon film	2.2	RD½VS 2R2J
R208	Carbon film	180	RD¼VS 181J
R209	Carbon film	3.3k	RD¼VS 332J
R210	Carbon film	680	RD¼VS 681J
R211	Carbon film	10k	RD¼VS 103J
R212	Carbon film	47k	RD¼VS 473J
R213	Carbon film	27k	RD¼VS 273J
R214	Carbon film	5.1k	RD¼VS 512J
R215	Carbon film	1.3k	RD¼VS 132J
R216	Carbon film	680	RD¼VS 681J
R217	Carbon film	6.8k	RD¼VS 682J
R218	Carbon film	470	RD¼VS 471J
R219	Carbon film	27k	RD¼VS 273J
R220	Carbon film	150	RD¼VS 151J
R221	Carbon film	56k	RD¼VS 563J
R222	Carbon film	22k	RD¼VS 223J
R223	Carbon film	2.7k	RD¼VS 272J
R224	Carbon film	8.2k	RD¼VS 822J
R225	Carbon film	39k	RD¼VS 393J
R226	Carbon film	150	RD¼VS 151J
R227	Carbon film	47k	RD¼VS 473J
R228	Carbon film	15k	RD¼VS 153J
R229	Carbon film	3.9k	RD¼VS 392J
R230	Carbon film	12k	RD¼VS 123J
R231	Carbon film	3.3k	RD¼VS 332J
R232	Carbon film	3.3k	RD¼VS 332J
VR1	Semi-fixed	3.3k-B	PCP-001
VR2	Semi-fixed	4.7k-B	PCP-002

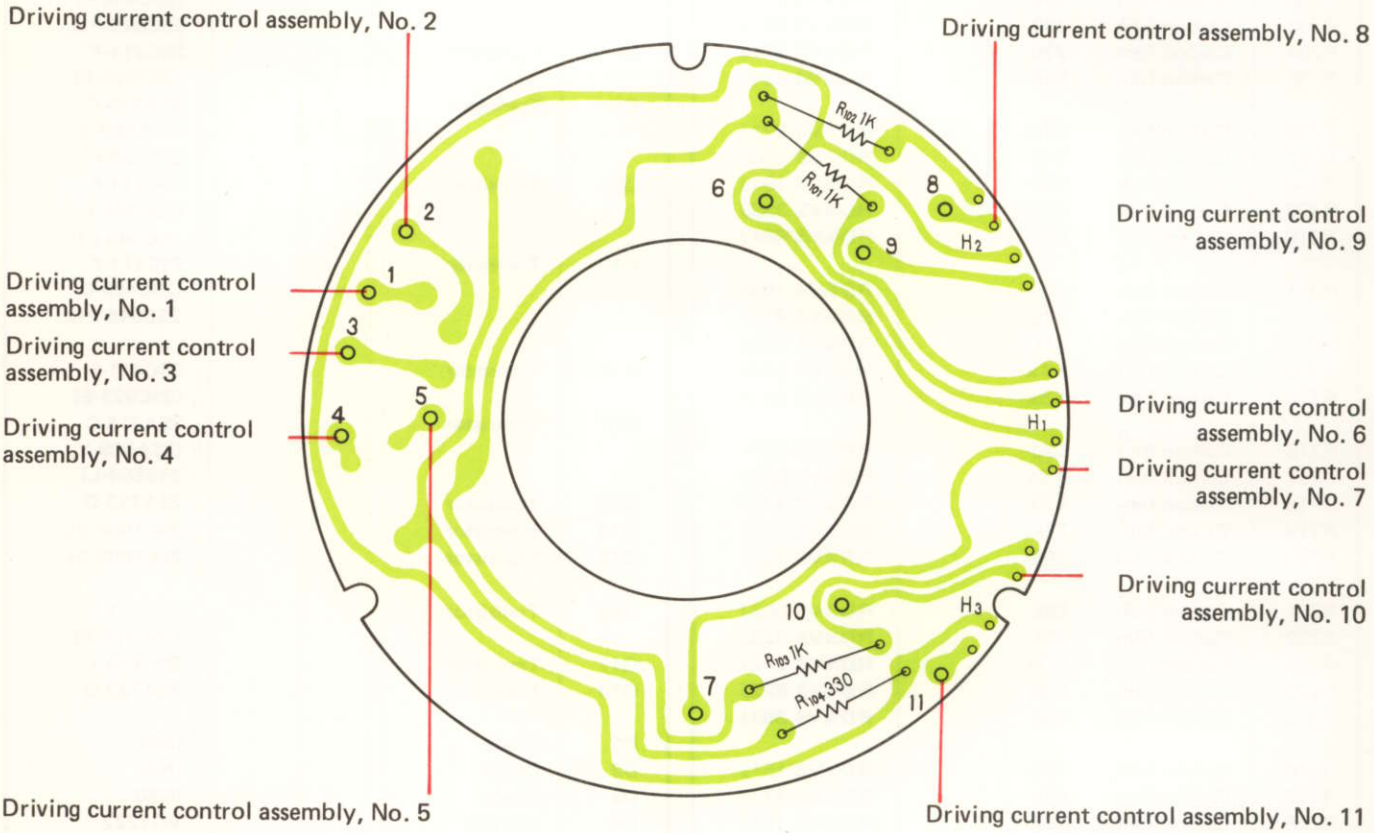
SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC711-F (2SC458-C, 2SC945-P1)
Q2	Transistor	2SC711-F (2SC458-C, 2SC945-P1)
Q3	Transistor	2SC711-F (2SC923-E)
Q4	Transistor	2SA715-C (2SA509-Y, 2SB564-L)
Q5	Transistor	2SC711-F (2SC458-C, 2SC945-P1)
Q6	Transistor	2SC711-F (2SC458-C, 2SC945-P1)
Q7	Transistor	2SC711-F (2SC923-E)
Q8	Transistor	2SA715-C (2SA509-Y, 2SB564-L)
Q9	Transistor	2SC711-F (2SC458-C, 2SC945-P1)
Q10	Transistor	2SC711-F (2SC458-C, 2SC945-P1)
Q11	Transistor	2SC711-F (2SC923-E)
Q12	Transistor	2SA715-C (2SA509-Y, 2SB564-L)
Q13	Transistor	2SA733-Q
Q14	Transistor	2SC1000-BL
Q15	Transistor	2SC1000-BL
Q16	Transistor	2SC711-F (2SC923-E)
Q17	Transistor	2SC735-Y
Q18	Transistor	2SA733-Q
D1	Diode	IN60
D2	Diode	IN60
D3	Diode	IN60
D4	Varistor	VD1222
D5	Varistor	VD1222
D6	Varistor	VD1124
D7	Varistor	VD1124
D8	Varistor	VD1124
D9	Zener diode	WZ081
D10	Varistor	VD1222
D11	Varistor	VD1124

NOTE:

1. *Q_1, Q_2, Q_5, Q_6, Q_9, and Q_{10} should, on the same circuit board, use the same kind and rank of product.*
2. *Q_3, Q_7, Q_{11}, and Q_{16} should, on the same circuit board, use the same kind and rank of product.*
3. *D_1, D_2, and D_3 should be 'paired' (PYY-006-0).*

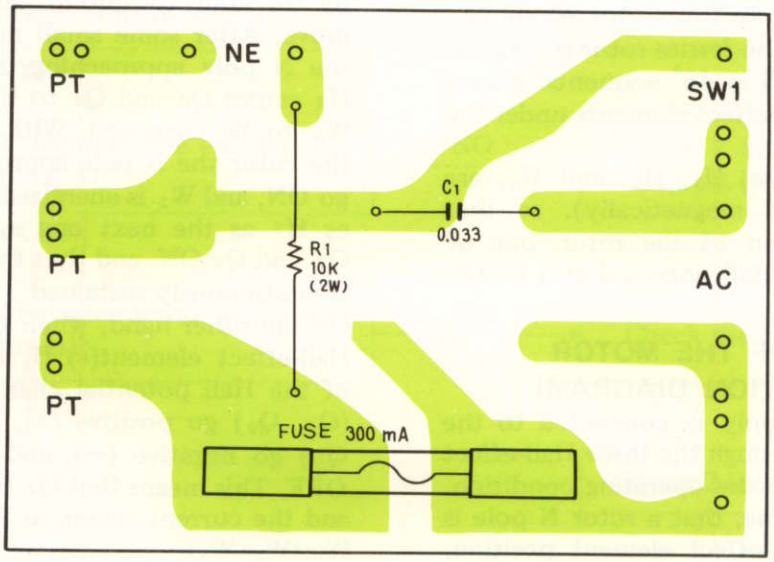
6.4 POSITIONAL DETECTOR ASSEMBLY (PWX-004)



Parts List of Positional Detector Assembly (PWX-004)

Symbol	Description	Part No.
H1	Hall-effect element	PCX-001
H2	Hall-effect element	PCX-001
H3	Hall-effect element	PCX-001
R101	Carbon film resistor 1k	RD¼PS 102J
R102	Carbon film resistor 1k	RD¼PS 102J
R103	Carbon film resistor 1k	RD¼PS 102J
R104	Carbon film resistor 330	RD¼PS 331J

6.5 POWER SUPPLY ASSEMBLY A (PWR-816)



Parts List of Power Supply Assembly A (PWR-816)

Symbol	Description			Part No.
C1	Myler	0.033		KCE-009
R1	Metal oxide	10k	2W	RS2P 103J
FU	Fuse Fuse clip	300mA		E21-030 K91-006

7. PXM-020 OUTLINE OF OPERATION

7.1 STRUCTURE

The PXM-020 is an external-rotor type DC motor in which Hall-effect elements are used to detect the rotor position, with electronic ON-OFF switching of the current to the motor windings.
As shown in Figure 1a, the ferrite rotor is magnetized alternately N and S in 45° segments. Figure 1b shows the three Hall-effect elements under the rotor.
The Hall-effect elements, H_1, H_2, and H_3, are fitted 30° apart (120° magnetically), so that whatever the orientation of the rotor, one of them will experience a Hall potential at a particular time.

7.2 OPERATION OF THE MOTOR (SEE CONNECTION DIAGRAM)

When the electrical supply is connected to the motor, current flows through the three Hall-effect elements, which go into the operating condition. If we assume, at this time, that a rotor N pole is located at the H_1 Hall-effect element position, then the Hall potential developed in H_1 sends the base of Q_1 negative (−) and that of Q_2 positive (+). Due to this Hall-effect potential Q_2 turns ON, voltage at the Q_2 collector drops, the potentail on the base of Q_4 drops, and Q_4 turns ON. With Q_4 ON, the motor drive coil W_1 is energized by the collector current, and the rotor begins to move. After some small movement of the rotor, the N pole approaching the Hall-effect element H_2 causes Q_6 and Q_8 to turn ON, and drive coil W_3 to be energized. With further movement of the rotor the N pole approaches H_3, Q_{10} and Q_{12} go ON, and W_2 is energized. The first N pole passes H_3 as the next one approaches H_1, putting Q_2 and Q_4 ON, and thus the rotation of the rotor is continuously sustained.
On the other hand, when a S pole approaches the Hall-effect element(s) H_1 (H_2, H_3), the polarity of the Hall potential changes, the base(s) of Q_1 (Q_5, Q_9) go positive (+), the base(s) of Q_2 (Q_6, Q_{10}) go negative (−), and so Q_2 (Q_6, Q_{10}) turn OFF. This means that Q_4 (Q_8, Q_{12}) also turn OFF and the current ceases to flow in the drive coil(s) W_1 (W_2, W_3).

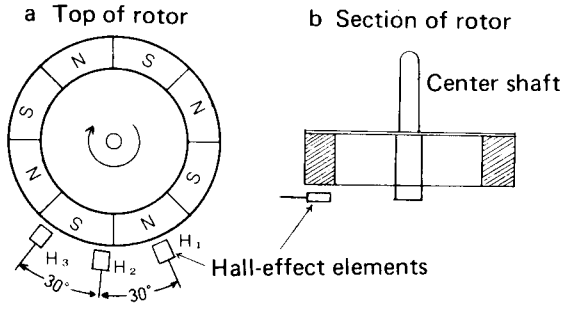


Fig. 1: Relative Locations of Rotor and Hall-Effect Elements

7.3 SPEED CONTROL

When no current is flowing through a drive coil (that is when a S pole is approaching the Hall effect element), a voltage proportional to the speed of rotation of the rotor is induced in the drive coil (the same effect as with a generator). This voltage is rectified by the diode(s) D_1 (D_2, D_3), and the negative potential derived is applied to the base of Q_{14}. Q_{14} and Q_{15} form a differential amplifier circuit, and the standard voltage for 33-1/3 or 45 rpm rotation is applied to the base of Q_{15}. It follows that so long as the rotor is

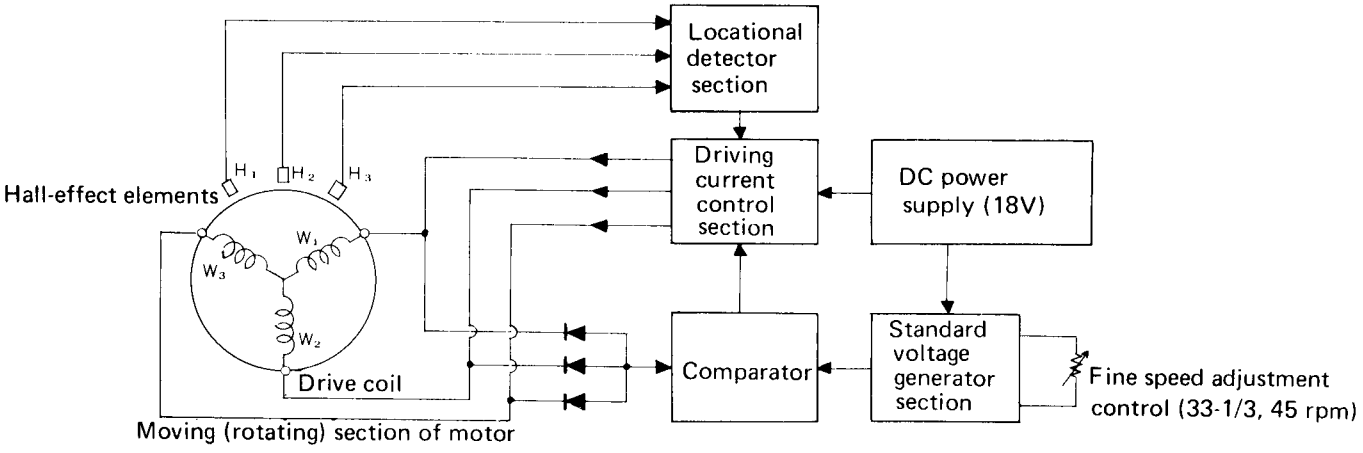


Fig. 2: Block Diagram of the PXM-020

turning at the correct speed (revs), this circuit is balanced. If for any reason the speed of ratation of the rotor exceeds the proper value, the voltage generated in each drive coil will increase.

This causes the potential on the base of Q_{14} to drop, and the potential on the bases of Q_{18} and Q_{13} rises. As the potential on the base of Q_{13} rises, the collector current drops and this reduces the potential on the base(s) of Q_3 (Q_7, Q_{11}). This results in a reduction in the current flowing through Q_2 (Q_6, Q_{10}), and a rise in the potential on the base(s) of Q_4 (Q_8, Q_{12}), so that the collector current(s) of Q_4 (Q_8, Q_{12}) drop. If the collector current drops, the field strength of the drive coil also drops, the rotor speed drops, and it returns to the correct speed of rotation.

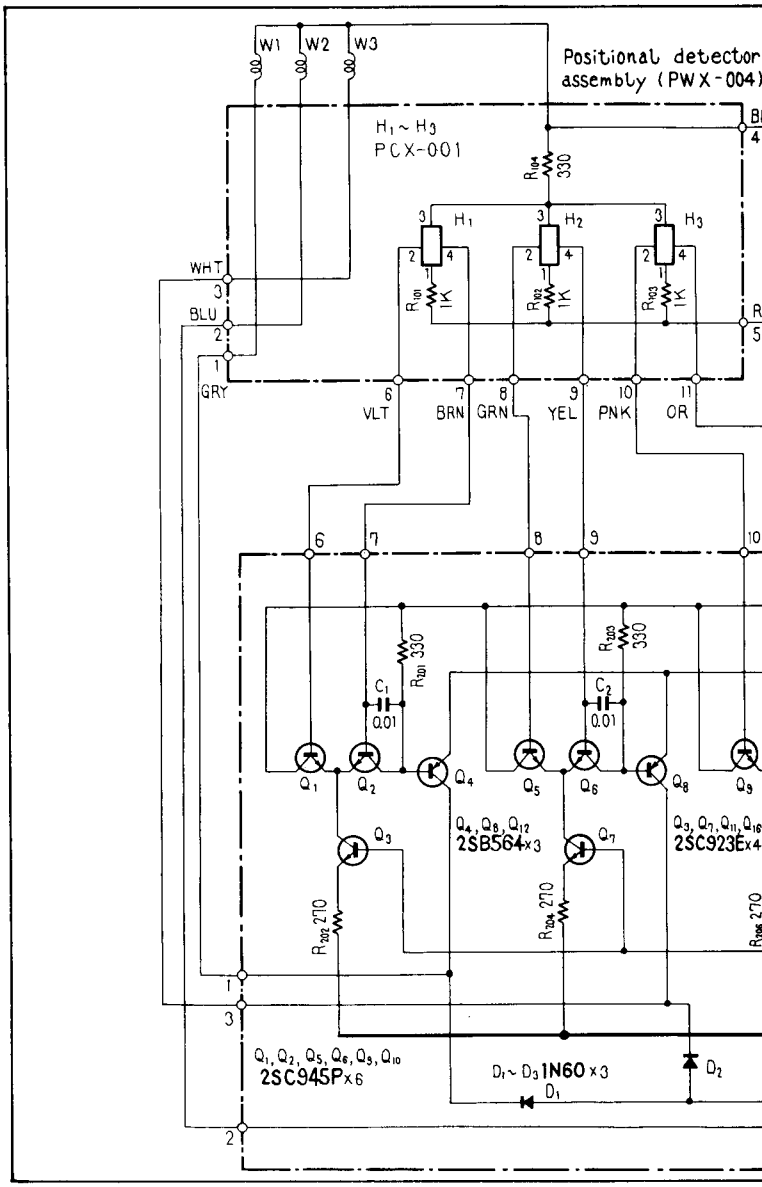
On the other hand, if the rate of rotation of the rotor drops below its proper value, the process is precisely the reverse of the above: the voltage across each drive coil drops, and the base potential of Q_{14} rises. This causes the collector current of Q_{13} to increase, and the current(s) through Q_1 (Q_7, Q_{11}) and Q_2 (Q_6, Q_{10}) also rise. As the collector current(s) of Q_2 (Q_6, Q_{10}) increase, the base potential(s) on Q_4 (Q_8, Q_{12}) drop, the collector current(s) rise, the magnetic field strength of the drive coil(s) increases, and the rotor speed increases to the correct value.

7.4 TEMPERATURE COMPENSATION

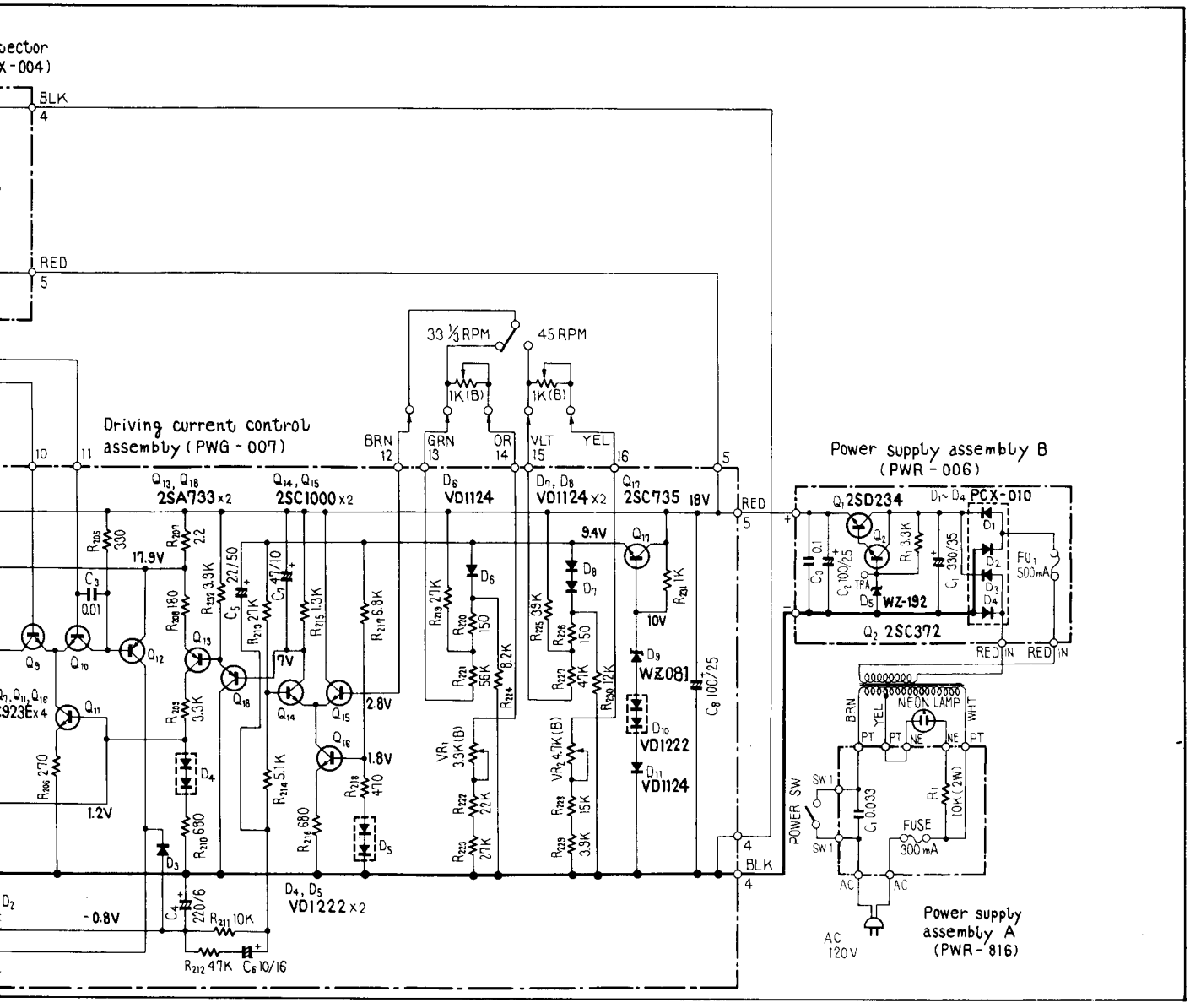
The section which corrects the speed of rotation of the motor as the ambient temperature changes comprises varistors (D_4, D_5, D_6, D_7, D_8, D_{10}, D_{11}) to achieve temperature compensation.

- D_4 compensates Q_3, Q_7, and Q_{11}. If D_4 were not provided, an increase in temperature would be accompanied by a drop in the $V_{B\text{-}E}$ of Q_3, Q_7, and Q_{11}, and an increase in the collector currents. This would result in a drop in the base potentials of Q_4, Q_8, and Q_{12}, and an increase in their collector currents with, in turn a higher current through the drive coils and a corresponding increase in the speed of revolution. The temperature coefficient of D_4 (VD1222) is -3.6mV/°C, which ensures that the bases of Q_3, Q_7, and Q_{11} do not drop in potential, so that the motor speed will not increase.
- D_5 compensates Q_{16}. If D_5 were not provided, an increase in temperature would cause an increase in Q_{16} collector current, and a corresponding increase in Q_{14}, Q_{15}, Q_{18}, Q_{13}, with a rise in the base potential of Q_3, Q_7, and Q_{11}, and an increase in the speed of the motor.
- D_6, D_7 and D_8 provide the temperature compensation for rotor magnetism. Magnetic field strength drops at $-0.18\%/°C$ with an increase in temperature. For this reason, if D_6, D_7 and D_8 are not provided, even at the proper rate of rotation, the voltage generated in the drive coils would drop, because the comparator would indicate that the speed has dropped, and so the motor speed would. D_6 (33-1/3) D_7 and D_8 (45 rpm) raise the potential at the base of Q_{15} as the temperature rises, preserving the balance of Q_{14} and Q_{15}, and maintaining proper speed.

CONNECTION DIAGRAM

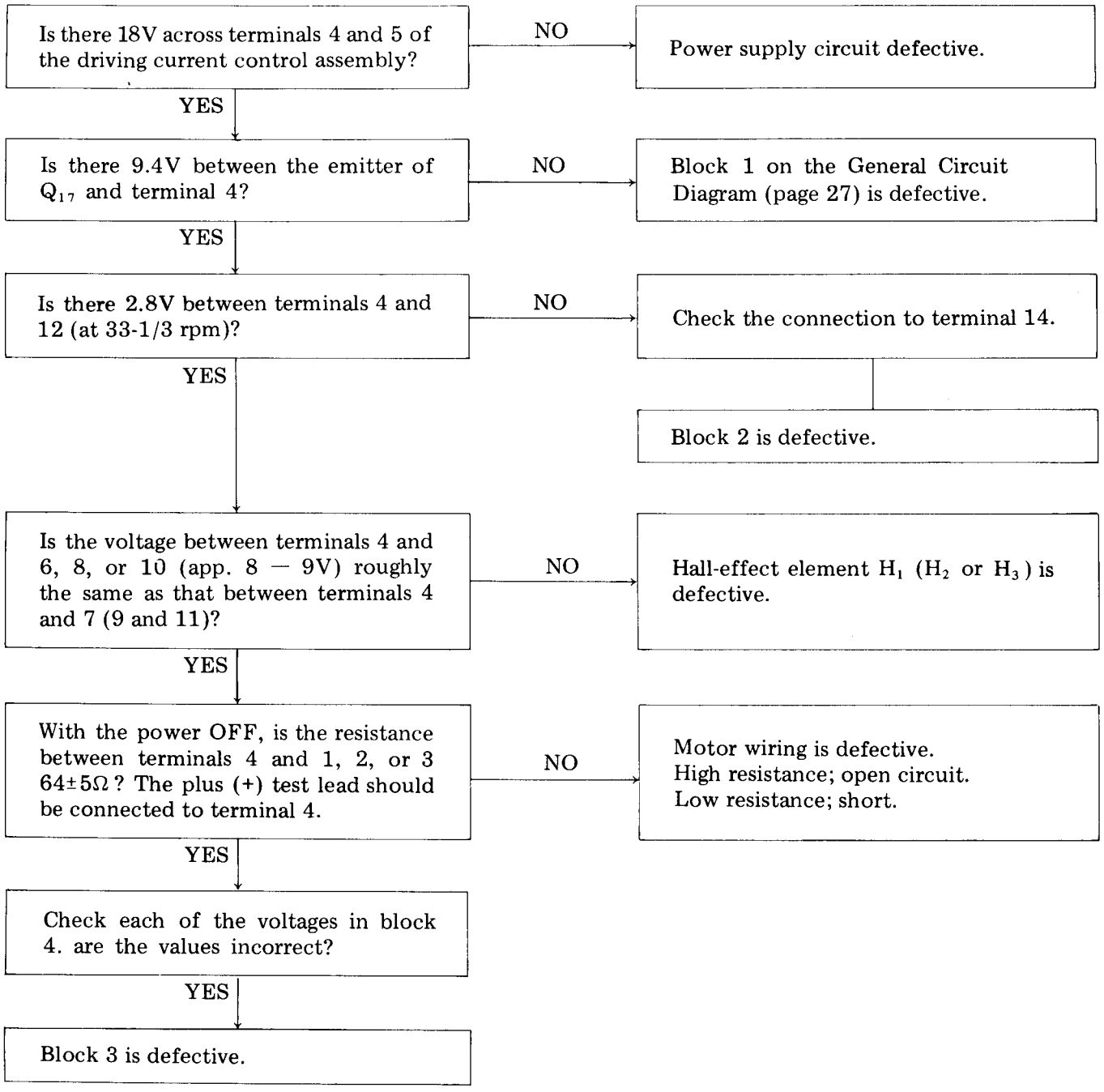


- D_{10} and D_{11} compensate D_9 and Q_{17}. D_6 (WZ081) is a zener diode. The zener temperature coefficient is 0.05%/° C. If D_{10} and D_{11} are not provided, as the temperature rises the zener potential will rise, so that the $V_{B\text{-}E}$ of Q_{17} drops, raising the emitter potential (the standard voltage) of Q_{17}. If the standard voltage rises, the speed of the motor also rises. This is the reason for the compensation by D_{10} and D_{11} for the rise in D_9 zener potential and the drop in $V_{B\text{-}E}$ potential of Q_{17}. The temperature coefficient of D_{11} (VD1124) is −1.9mV/ °C.

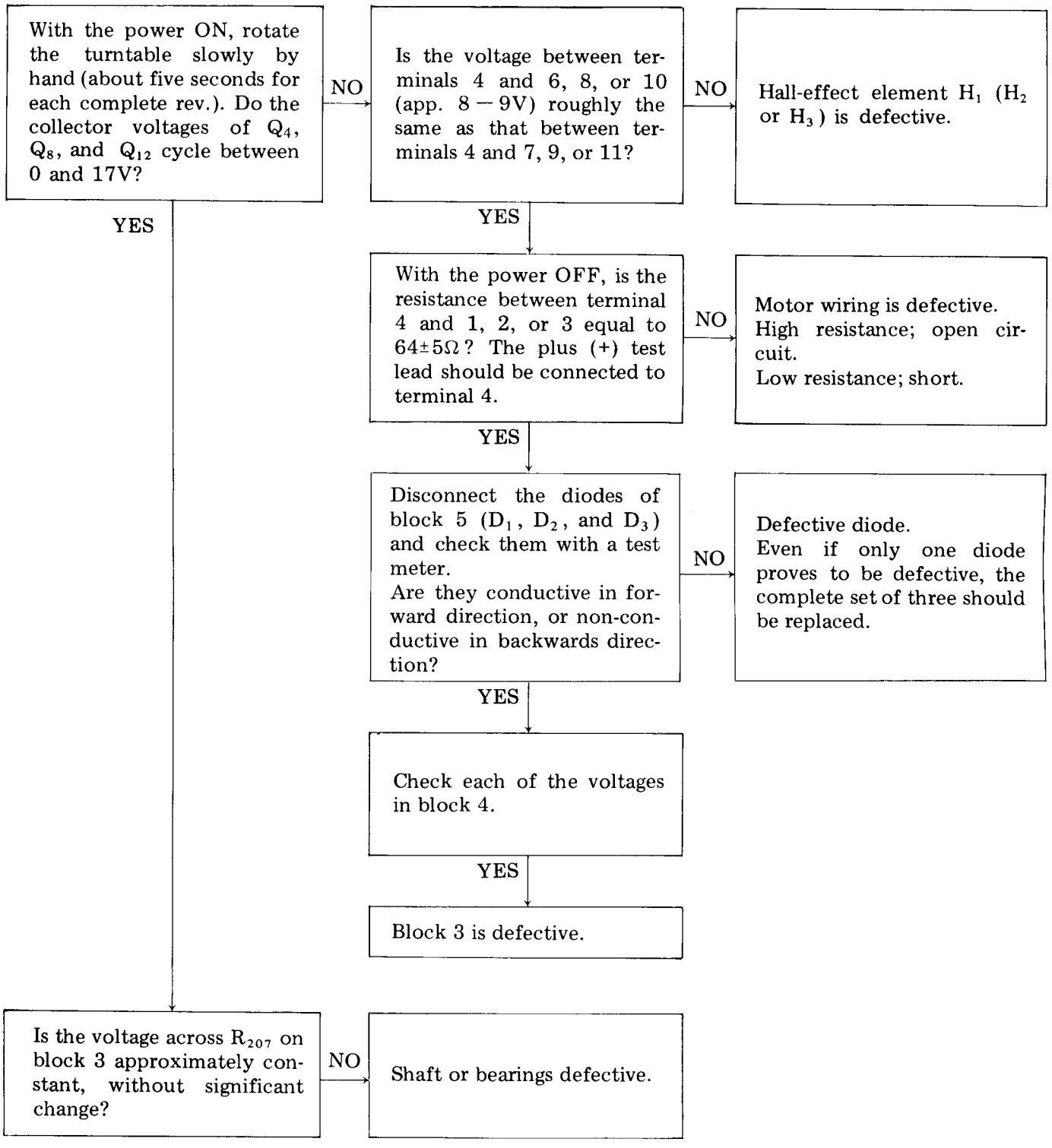


8. TROUBLE SHOOTING CHART

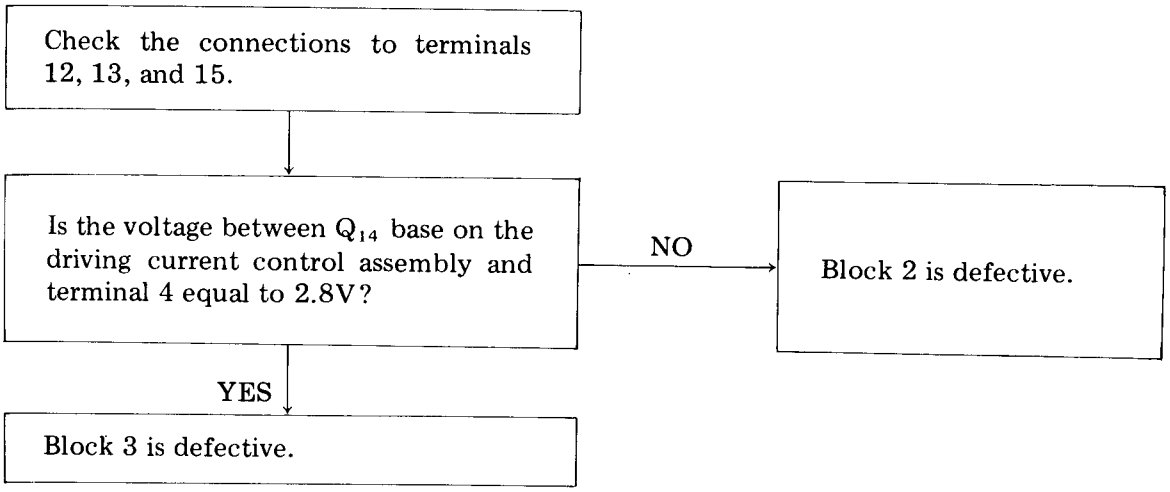
8.1 MOTOR DOES NOT TURN



8.2 WIDE VARIATIONS IN MOTOR SPEED



8.3 MOTOR RACES



9. ADJUSTMENT

9.1 MOTOR SPEED

When it proves impossible to adjust the fine speed controls to give the correct speeds, the motor may be adjusted as follows.

1. Set the fine speed adjustment controls on the stereo turntable to their mechanical centers (approx. in the middle).
2. The separate volume-type controls on the P.C. Board PWG-007 are accessible for both 33 and 45 rpm adjustments. Use a small screwdriver to turn these preset controls to give synchronization as indicated by the stroboscopic speed indicator on the record player.
3. When even turning the controls fails to give the required adjustment, refer to Connection diagram on page 6, and change R_{223} (33-1/3 rpm) and R_{229} (45 rpm) within the range 1.5kΩ to 5.6kΩ before repeating the adjustment.

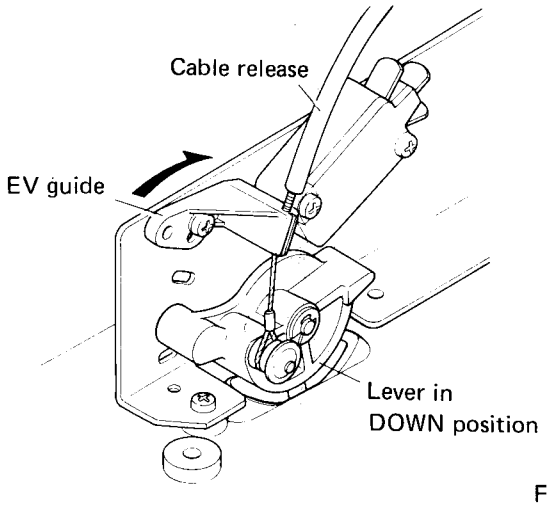


Fig. 1

9.2 ARM ELEVATION

Tonearm elevation is operated by a cable release. If the release stretches due to aging or other reasons, loosen EV guide screw (Fig. 1) and adjust cable release anchor condition. Perform this adjustment with tonearm elevation in DOWN setting. As adjustment standard, EV lever unit (Fig. 2) should tightly contact straight line portion of EV cam. Be sure to confirm operation after adjusting.

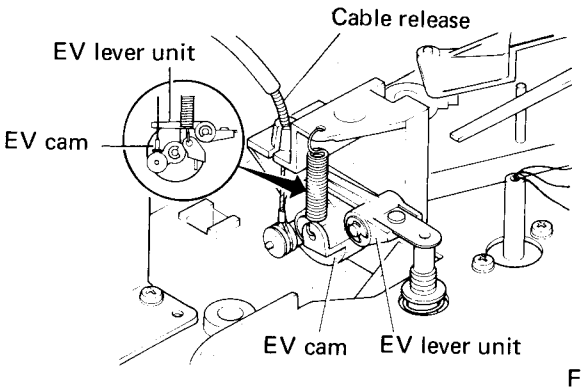


Fig. 2

DIRECT DRIVE
STEREO TURNTABLE
PL-510A
HGT

Additional

Service Manual

This leaflet provides the description of the parts applied only HGT model.
For detailed instructions on adjustments, description, etc., please refer to the Service Manual of PL-510A/KCT, KUT.

PIONEER®

10. SPECIFICATIONS (HGT model)

MOTOR AND TURNTABLE

Motor:	DC servo motor
Turntable Drive:	Direct drive
Speed:	Two speeds: 33-1/3 rpm, 45 rpm
Wow and flutter:	0.03% (WRMS) or less
S/N:	68dB (DIN B) or more (with Pioneer cartridge model PC-135)
Turntable platter:	321mm diam. aluminum alloy
Moment of inertia:	240kg-cm^2 (including rubber mat)

TONEARM

Tonearm type:	Static-balance, S-shaped, pipe arm
Effective arm length:	221mm
Tracking error:	+3° ~ 1°
Overhang:	15.5mm
Usable cartridge weight:	4g (MIN) ~ 10g (MAX)

(For cartridges weights over 8.5g, attach the sub weight)

SUBFUNCTIONS

Anti-skating force control
Plug-in type headshell
Oil-damped arm elevator
Hinges (Free-adjustable)
Lateral balance weight
Fine speed adjusters (33-1/3 rpm, 45 rpm: using the stroboscope for turntable speed adjustment)

ACCESSORIES

Headshell	1
Overhang gauge	1
45 rpm adaptor	1
Screwdriver	1
Sub weight	1
Cartridge mounting screws	6
Cartridge mounting nuts	2
Cartridge mounting washers	2
Operating instructions	1

MISCELLANEOUS

Power requirements:	AC 220V, 240V, 50Hz
Power consumption:	7W
Dimensions:	440(W) x 362(D) x 159(H)mm 17-5/16(W) x 14-1/4(D) x 6-1/4(H)in.
Weight:	8kg, 17 lb 10 oz

For Use in United Kingdom only.

Please note:

Models employ 3-conductor mains leads. Please read the following instructions carefully before connecting.

WARNING: THIS APPARATUS MUST BE EARTHED.

CAUTION 240V: MAINS SUPPLY VOLTAGE IS FACTORY ADJUSTED AT 240 VOLTS.

IMPORTANT

The wires in this mains lead are coloured in accordance with following code:

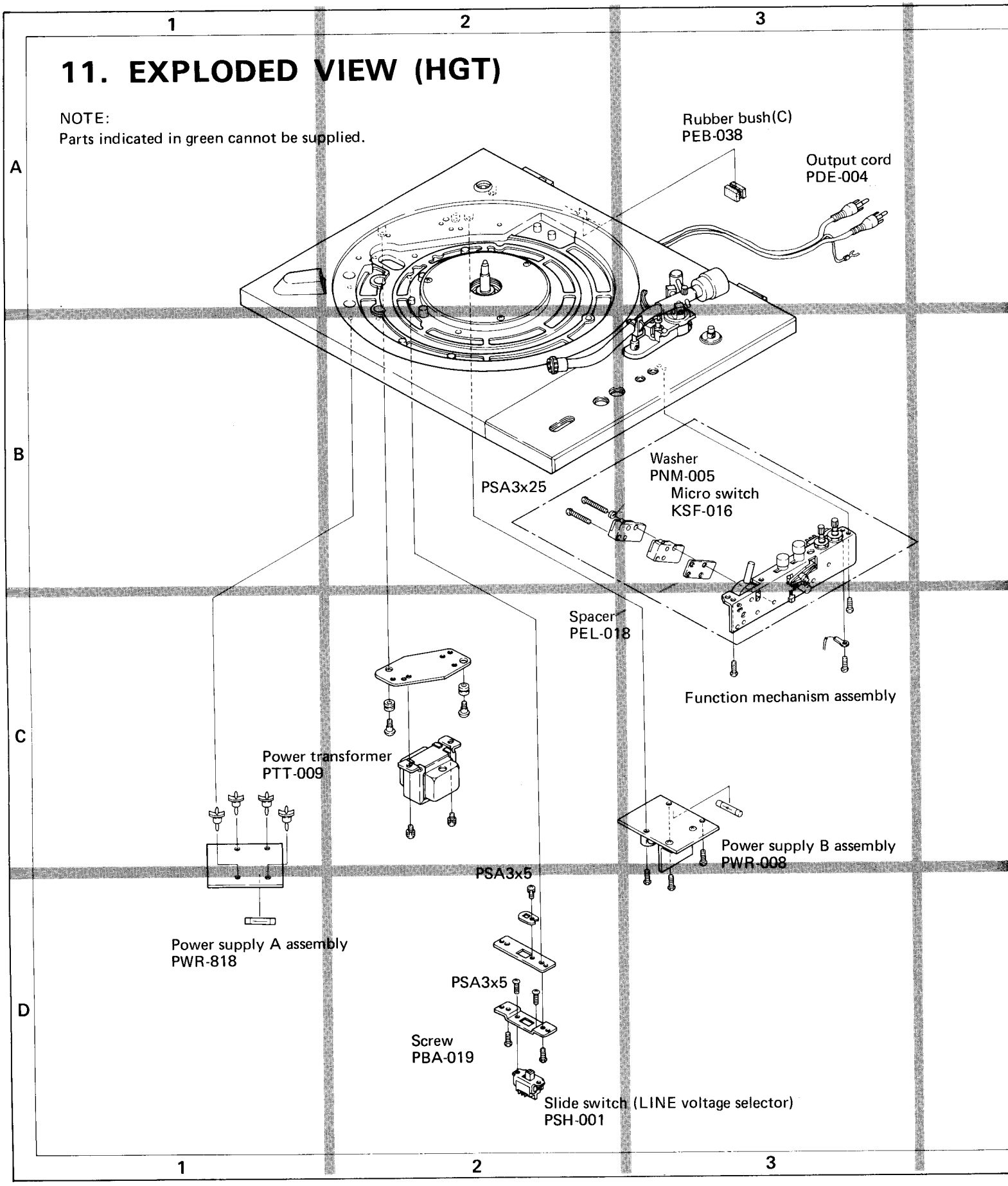
Green-and-yellow:	Earth
Blue:	Neutral
Brown:	Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows.
The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol ⏚ or coloured green or green-and-yellow.
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured blue or black.
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured brown or red.

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

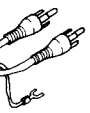
11. EXPLODED VIEW (HGT)

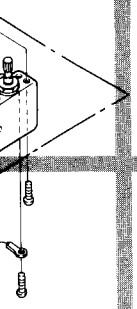
NOTE:
Parts indicated in green cannot be supplied.



The parts indicated the designation and parts number are newly-employed as HGT model.
The parts without description are the same as the parts in the KCT model.

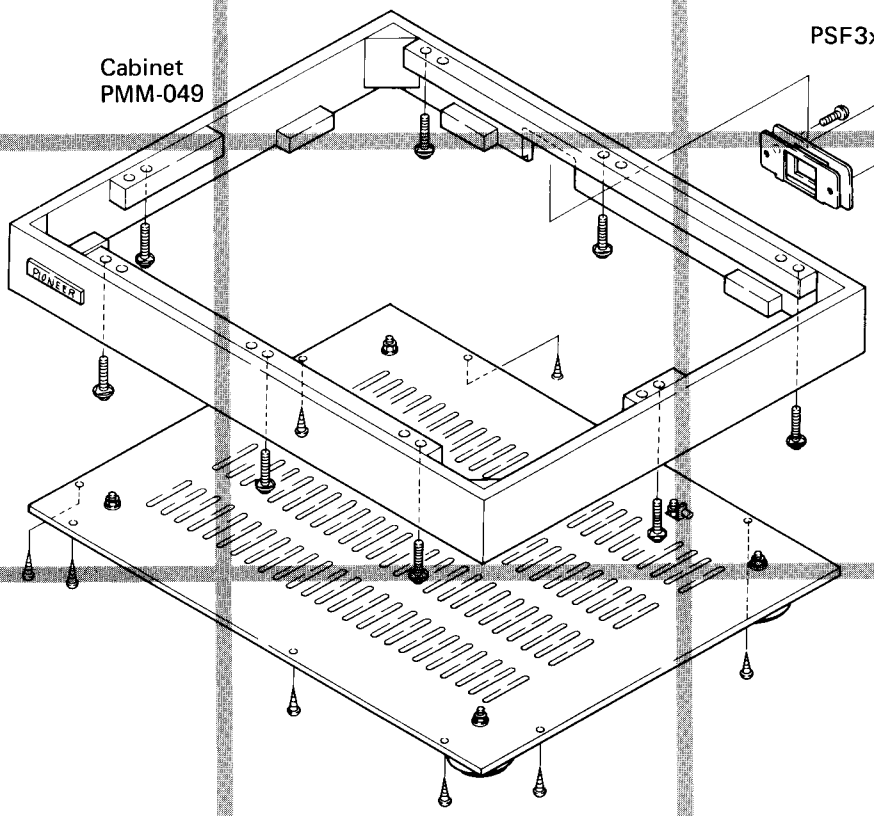
tput cord
E-004





assembly

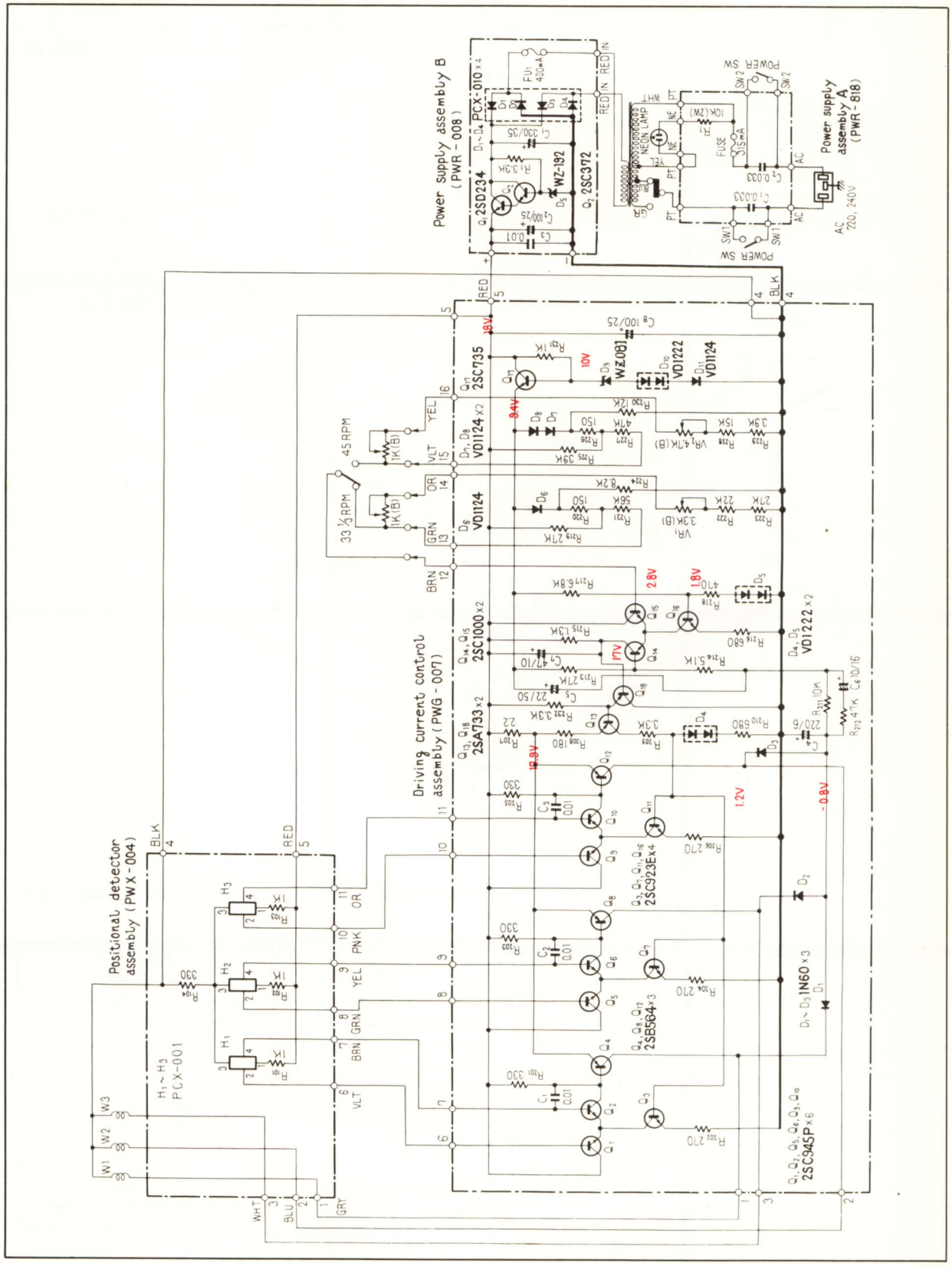
assembly



The following parts are changed the parts number as shown in the table.

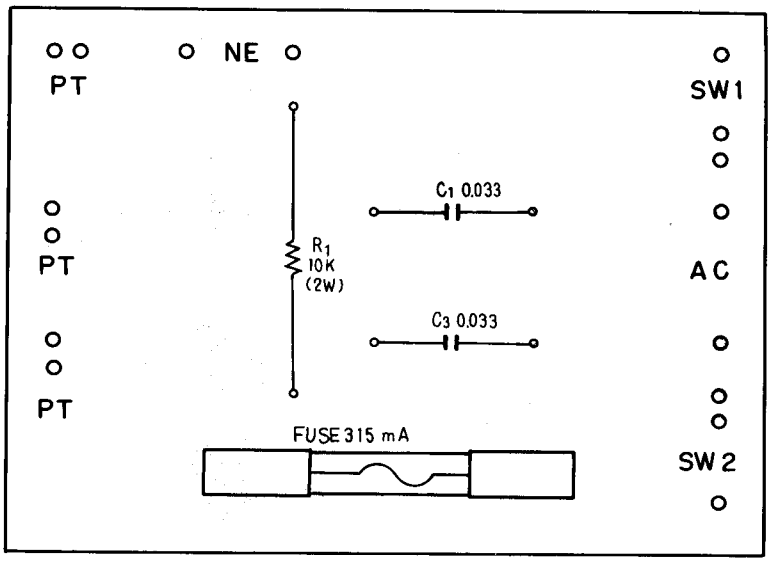
Part Name	Part No. (HGT model)
Anti skating assembly	PXA-641
Rubber mat assembly	PEA-013
Headshell assembly	PXA-630
Packing case	PHG-128
Power supply assemblyB	PWR-008
Fuse 0.4A	PEK-005
Fuse clip	KKR-001
Operating instructions	PRB-039 (English)
Operating instructions	PRD-016 (French/German)

12. SCHEMATIC DIAGRAM (HGT model)



13. P. C BOARD PATTERN AND PARTS LIST

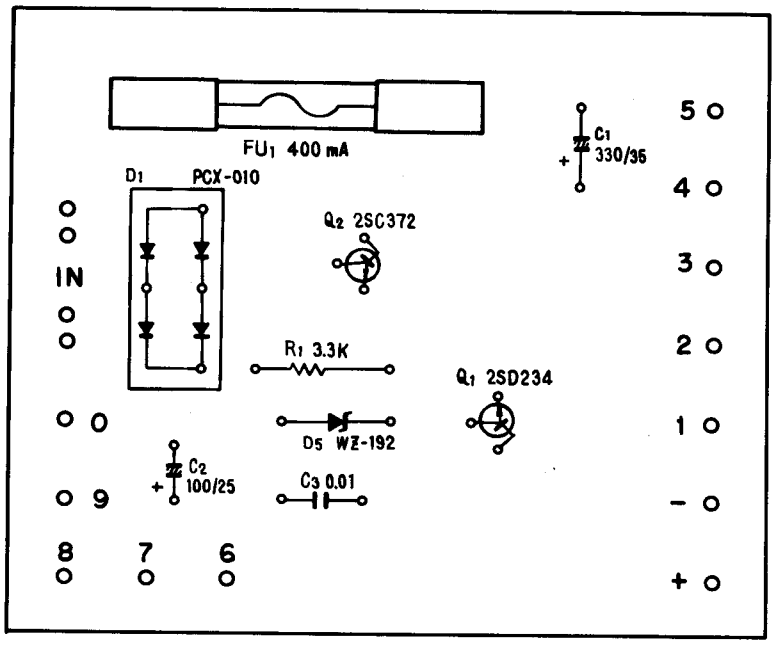
13.1 POWER SUPPLY ASSEMBLY A (PWR-818)



Parts List of Power Supply Assembly A (PWR-818)

Symbol	Description			Part No.
C1	Myler	0.033	250V	PCL-013
C2	Myler	0.033	250V	PCL-013
R1	Metal oxide	10k	2W	RS2P 103J
FU	Fuse	315mA		KEK-008
	Fuse clip			KKR-001

13.2 POWER SUPPLY ASSEMBLY B (PWR-008)



Parts List of Power Supply Assembly B (PWR-008)

Symbol	Description			Part No.
C1	Electrolytic	330	35V	CEA 331P 35
C2	Electrolytic	100	25V	CEA 101P 25
C3	Ceramic	0.01	50V	CKDYF 103Z 50
R1	Carbon film	3.3k		RD¼PS 332J
Q1	Transistor			2SD234
Q2	Transistor			2SC372
D1	Diode			PCX-010
D2	Zener diode			WZ-192
FU	Fuse	400mA		PEK-005
	Fuse clip			KKR-001

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